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THE I.C.I. MAGAZINE

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The *I.C.I. Magazine* is published for the interest of all who work in I.C.I., and its contents are contributed largely by people in I.C.I. It is printed at The Kynoch Press, Birmingham, and is published every month by Imperial Chemical Industries Limited, 26 Dover Street, London, W.1. Telephone: REGent 5067-8.

CONTENTS

Nylon Yarn, by Margaret P. Reekie	226
I.C.I. News	230
The Manufacture of Shotgun Cartridges	237
The English in Ireland, by Kevin Fitzgerald	242
Should my Son become an Accountant? by A. J. Steward	245
Information Notes No. 53	248
Once in a Lifetime, by Dorothy Thomas	253

Front Cover: Piercing Copper Billets at a Metals Division Factory near Birmingham.

The Editor is glad to consider articles for publication.
Payment will be made for accepted contributions.

OUR CONTRIBUTORS

KEVIN FITZGERALD, who writes entertainingly of the English in Ireland, has been for the last five years manager and local director of the I.C.I. selling company in Southern Ireland. He originally joined I.C.I. in 1928 on the technical agricultural staff. His amusements, he says, consist almost entirely of work, in the intervals of which he reads books and occasionally sleeps. But then he is an Irishman.

Concerning the article on British Nylon Spinners written by MARGARET P. REEKIE, B.N.S. Press Officer, Mr. A. J. Quig, chairman of British Nylon Spinners, writes: "I was asked to write the story of the company for publication in the Magazine. Miss Reekie has written such an interesting history that I feel I cannot do better than submit it as it stands for publication. I am sure readers of the Magazine will find the story quite engrossing."

A. J. STEWARD, I.C.I. Chief Accountant, has a long experience to draw on in giving advice on accountancy as a career. After qualifying as a chartered accountant, in 1923 he joined Thomson McLintock & Co., one of our joint auditors, and was in charge of the I.C.I. audit for 1927 and 1928. He joined the Company in 1929 and was appointed Assistant Accountant in that year. He has been Chief Accountant since 1938. A keen golfer, he won the I.C.I. Directors' Cup in 1947.

DOROTHY THOMAS, the author of a lively article on some of her more memorable experiences, is Magazine correspondent for Metals Division. She joined I.C.I. in 1937. Her hobby is amateur dramatics.

NYLON YA the first ten years in

By Margaret P. Reekie

ON THE FIRST OF JANUARY 1940, the day when the first wartime food rationing was announced, a new company was formed to make nylon yarns in Britain. It was called British Nylon Spinners Ltd., incorporated as a private company, with a capital subscribed in equal proportions by Courtaulds Ltd. and I.C.I. Ltd., to manufacture and sell yarns and staple fibres derived from nylon polymers. These polymers were to be made by I.C.I.

Two years before, at the New York World's Fair, the American firm of E.I. du Pont de Nemours Inc. had aroused world-wide interest by showing stockings made from their new synthetic yarn, which they had named nylon. Many people have speculated about what the word "nylon" stands for; in fact, the name, now included in standard dictionaries, was simply invented by du Pont. Their research workers, under Dr. W. H. Carothers, had discovered in 1930 that a fibre of unusual tensile strength could be drawn out from a treacly mass of linear polymers.

During the next eight years, development work went ahead in America on the manufacture of both nylon polymer and the yarns that could be spun from it. It was already clear that nylon was a very remarkable textile fibre. The new British company, originally holding nylon patents under licence from du Pont, was formed to develop nylon yarn for our home and overseas markets.

For its first five years, however, B.N.S. had only one customer, the Ministry of Aircraft Production. Urgent wartime demands for parachutes, parachute cordage and glider tow-ropes absorbed the whole of British nylon yarn production.

During 1940 an old north light weaving shed in Lockhurst Lane, Coventry, was converted into a plant for producing nylon yarn. Machinery was installed and ready when, on 14th November, bombs exploded among the spinning positions during the famous Coventry blitz. This damage delayed production work for some weeks, but at 11 o'clock on the night of 23rd January, 1941, the day when the Australian troops captured Tobruk, the first nylon yarn spun in Britain was produced. Further developments were not slow to follow. Some twelve months later the Huddersfield factory of Dyestuffs Division was producing the first British-made polymer and by December 1942 a second B.N.S. factory, on a site leased from I.C.I. at Stowmarket in Suffolk, went into production.

During 1944, however, plans were made to construct a new plant, where B.N.S. could concentrate all their production and turn out nylon yarns at the rate of ten million pounds a year—ten times the wartime amount. The Government was insisting that new factories should be built in one or other of the scheduled Development Areas, so some dozens of sites were inspected.

The choice was not an easy one. Nylon yarn needs clean air, away from the dust and smoke of congested industrial

RN- Britain



At the B.N.S. factory, Pontypool, modern architecture and industrial purpose are firmly wedded. Grace and height combine in the central tower to provide space and fall for the nylon spinning.

areas; but a plant on the scale planned, with a million square feet of floor space, must obviously be served by efficient fuel and water supplies and have easy access by road and rail. Finally a site of 112 acres was chosen at Mamhilad, on the eastern fringe of the South Wales Development Area. This is a country district, two miles north of Pontypool in Monmouthshire, where the road from Newport runs through a valley towards the Black Mountains north of Abergavenny.

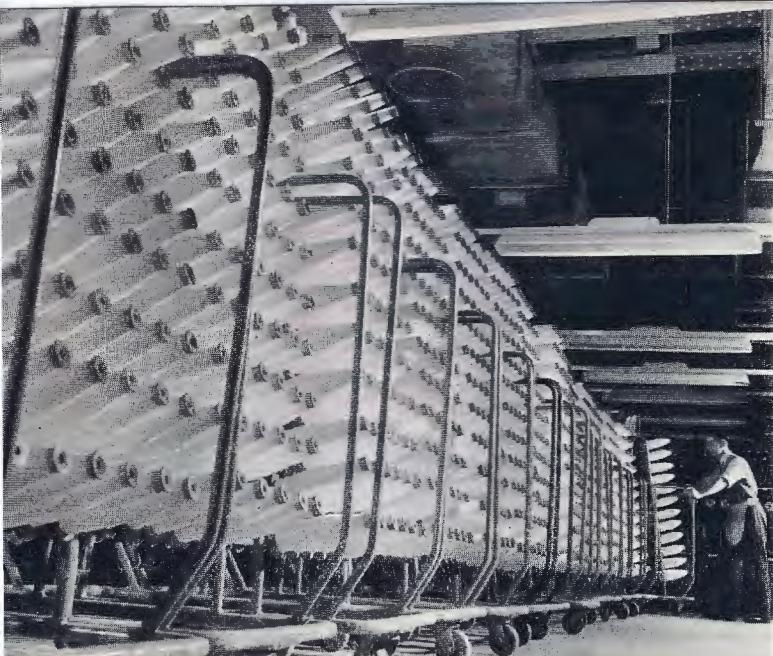
The factory, which has been described as one of the finest examples of modern industrial architecture, had to be built during the period when post-war shortages of men and materials were most acute. There was a serious lack of skilled craftsmen, an almost complete scarcity of timber, and a shortage of bricks, of which five million were needed. A disused brickworks opposite the site was reopened; the bricks were laid mainly by trainees, as skilled bricklayers could not be found. Monmouthshire weather is no help on outside construction work—the rainfall at Pontypool is double that of London. In spite of difficulties, however, production began in part of the main plant on 19th April, 1948. The Coventry factory was closed down in August of that year and the Stowmarket one in the following October, so that all resources could be concentrated at Pontypool.

At Billingham, I.C.I. were also facing post-war difficulties on the job of constructing a new plant to make enough nylon

polymer to supply Pontypool. It is commonly said that nylon is made from coal, air and water. Certainly the raw materials from which the hexamethylene diamine and adipic acid for making nylon polymer are obtained are phenol from coal, oxygen and nitrogen from the air, and hydrogen from water; but this description makes it all sound far too simple. The chemical synthesis which produces nylon polymer is an exceedingly complicated process, and the large-scale work at Billingham created problems unknown at the smaller Huddersfield factory.

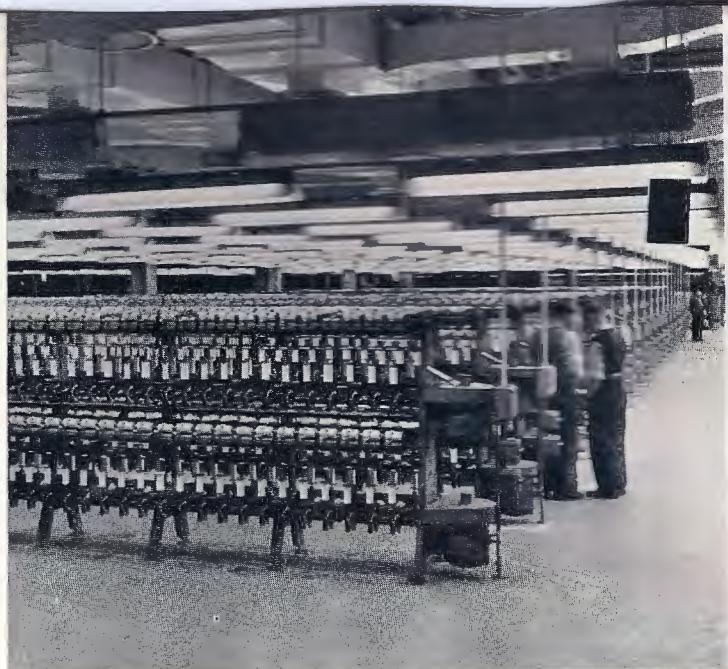
By now, however, these problems have largely been overcome; containers holding 4½ tons of polymer chips travel regularly from Billingham to the unloading bay under the five-storey spinning tower which dominates the B.N.S. factory. Yarn production is increasing steadily and should reach the rate of ten million pounds a year within the next few months.

The actual production of nylon yarns is a combination of a highly specialised extrusion process, a second stage known as "cold drawing" which is also peculiar to nylon, and a series of further processes, such as gumming, throwing and winding on to cones or other packages, which are similar to processes carried on in other textile mills. All the machinery installed at Pontypool was made in Britain, most of it specially designed for the job.



Bobbins of nylon yarn await processing

The polymer chips are poured into hoppers set in double banks across the third floor of the spinning tower. Here the polymer is melted and extruded through spinnerets (metal discs pierced into fine holes). As the molten polymer streams through the spinneret down to the storey below it is cooled and hardened by currents of air. This feature of the process is not unlike the final stage of polymer manufacture at Billingham, where a stream of molten polymer flows over a wheel and is cooled and hardened by water before it is chipped. At Pontypool the separate strands of finely extruded



Nylon yarn being "thrown" for stockings

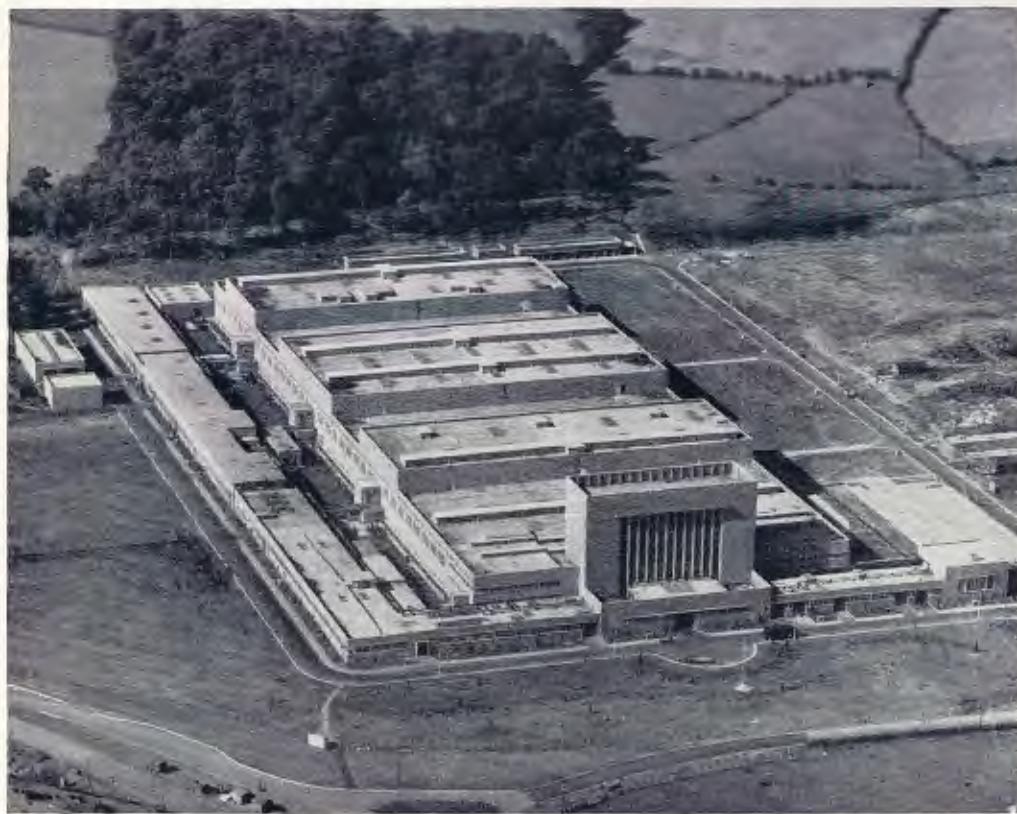
polymer pass on at controlled tension down to the ground floor of the tower, where they are wound up on to cylinders.

It is the next stage of the process, defined in the patent as "cold drawing," which converts the extruded polymer into a textile fibre. The yarn is stretched to approximately four times its original length. During this operation, the molecules forming the yarn are drawn from a confused mass into an orderly formation.

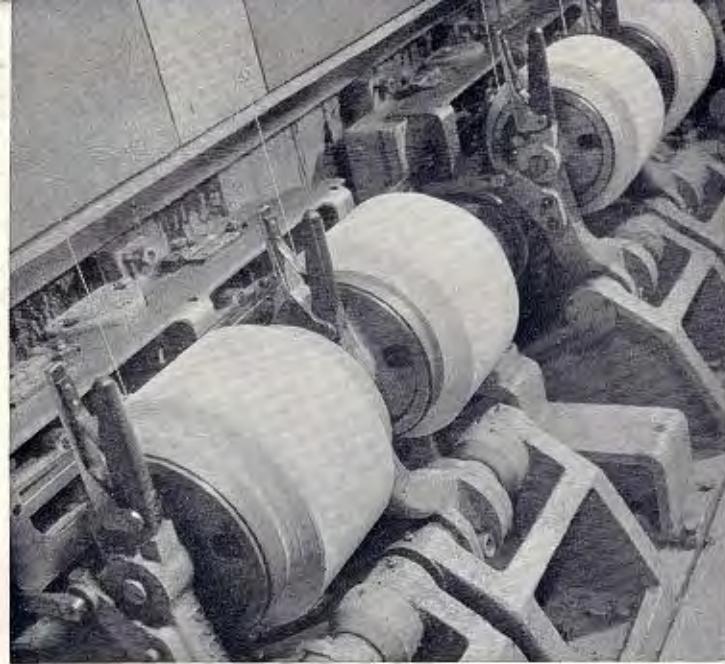
The drawn yarn, white and shining, is wound on to bobbins which look like pint milk-bottles, each one enough to make about

two dozen pairs of nylon stockings. It is then put through a number of further processes, depending on the type of yarn, its denier, and the purpose for which it is intended. (Denier, by the way, simply denotes the thickness of the yarn; the lower the denier number the finer the yarn, so 15-denier nylon stockings are twice as fine as 30-denier.) Nylon can be knitted and woven on existing textile machinery, but as so many different types of machines are involved the yarn has to be wound on to various packages to suit the hundreds of textile manufacturers now supplied by B.N.S.

Productive work is on a continuous three-shift system. When production started in the main Pontypool plant there were a hundred men on the job, all recruited locally. Now 2235 men and 229 women are clocking in altogether B.N.S. employs 3228 people.



The B.N.S. factory at Pontypool, where all the nylon yarns made in Britain are produced, is nearly a quarter of a mile long and has a floor space of a million square feet



Nylon yarn in the last stage of spinning process

This may seem a comparatively small total for a plant that is said to be the biggest multi-storey factory under one roof in Europe, but the high-precision processes involved in the manufacture of nylon yarns demand skilful handling rather than numbers. Even three thousand people is a considerable concentration for the locality, which is made up of small towns and scattered villages. B.N.S. has had to organise its own transport—fleets of buses bring the workers in from fifteen miles around.

Nylon is an astonishing yarn, unique among textile fibres in its combination of properties. Because nylon combines high tensile strength and durability with lightness in weight, it is possible to make sheer fabrics in nylon which look delicate but are nevertheless extraordinarily strong. Before nylon was invented, the normal method of making a fabric stronger was simply to make it heavier.

Although nylon is actually stronger than steel of the same weight, it is elastic and flexible. It has a low moisture absorption, so that it dries quickly, and is practically as strong wet as it is dry. Easy to wash or clean, nylon resists deterioration by mildew, petroleum oils, alkalis and soil rot, which gives it definite advantages over many industrial textiles; and it has no attraction for moths or other insects.

Nylon first became world-famous as a yarn for women's stockings, partly for its looks and fit but even more because it saves hours of darning. "Nylons" are no mere luxury product; certainly they are worn at fashion shows, but they are also chosen for policewomen's and nurses' uniforms because they wear so well. More than three miles of yarn are needed for each pair of stockings; during 1949 B.N.S. sold enough yarn to stocking knitters to produce something like fifty million pairs. Rather more than half Pontypool's production goes to hosiery manufacturers, but stockings are only the beginning of the nylon story.

Already nylon is used for some two hundred different purposes, domestic and industrial. It will be used for many more, but demand is at present far ahead of supply. The pilot plant at Pontypool has now become an experimental plant, where research and textile development work are directed towards developing nylon's possibilities to the fullest extent.

For dress and underwear fabrics, nylon has become popular



Testing yarn for the sheerest of nylons

for its practical qualities. Weavers are producing many varieties of nylon voiles, chiffons, nets, marquisettes, satins and taffetas; warp-knitters are turning out a wide range of plain and fancy tricots, much in demand because they need no ironing at all. Swimsuits and slippers, ribbons and laces, raincoats and umbrellas, hats and ballet shoes—all are being made in nylon. One of the latest developments is the heat-setting of nylon fabrics into permanent pleats which remain pleated however often they are washed.

Among industrial textiles nylon has set new standards of performance. A nylon rope is almost twice as strong as a manila rope of the same thickness; nylon is now used for all types of cordage, from ships' hawsers to the rudder-lines of the Cambridge boat. In factories, nylon makes overalls and protective clothing, webbing and belting, tarpaulins and filter cloths. Laundries are using nylon press cloths, calendar guide tapes, dye and laundry bags. In the air, besides parachutes, nylon makes flexible petrol tanks, lightweight luggage and flameproof curtains and gives extra strength to tyres as aircraft tyre cord. At sea, besides ropes and cordage of all kinds, nylon is used for trawling nets and yacht foresails.

The latest development at Pontypool, the production of nylon staple, brings nylon into a new range of textiles, for this staple yarn looks and feels like wool but is much stronger and will not shrink. Men's socks containing nylon staple are already on sale; experiments are going ahead with knitted garments, suiting, and dress and upholstery fabrics.

Nylon is already earning overseas currency for Britain. About 15% of B.N.S. yarn is exported, mainly to Australia and New Zealand, but British nylon stockings are worn by women in seventy different countries. Our nylon fabrics, especially tricots and sheers, are selling in America and Canada as well as other countries. During 1950, nylon, either as yarn or fabrics, will contribute about ten million pounds sterling to the export trade of this country. As the raw materials do not have to be imported, this export represents a substantial gain for Britain.

Nylon is a versatile yarn with a great future. It is one of the chemical industry's major contributions to textiles, and British Nylon Spinners has already become a vital unit in the textile industry of this country.

I.C.I. NEWS

HEAD OFFICE

Mr. J. Paterson

The death is recorded with deep regret of Mr. John Paterson, head of the Pensions and Assistance Funds Department, on 21st June at the age of 55.

Mr. Paterson joined Nobel's Explosives Co. Ltd. in 1914 and on the formation of I.C.I. transferred to the Statistical Department (later Intelligence Department). In 1938 he was appointed head of the Intelligence Department and in 1945 was appointed Secretary of the Pension Funds and deputy head of the Pensions and Assistance Funds Department. He became head of that department in 1947.



Mr. J. Paterson

A friend and colleague writes:

In the premature death of John Paterson the Company has lost a valued and most loyal employee, and many of us a real friend. To those of us in all walks of life who knew him intimately as a friend and colleague he endeared himself by his many acts of kindness and thoughtful consideration for others.

John joined the Company as far back as 1914 as a junior clerk in the Accounts Department of Nobel's Explosives Co. Ltd. Even at that early stage in his career his friends recognised his intellectual gifts, for he possessed a quality of clear

thinking and facility of expression in speech and writing, and these stood him in good stead in the latter years of his work for the Company.

His charming personality permeated any gathering at which he was present, and his ready humour and skill as a raconteur impressed themselves on all who met him. His prowess in the field of sport, particularly bowls, was well known, and he was justly proud of the honour shown to him when he captained England—although a Scot—in 1947. John was a grand chap, and his cheery presence will be greatly missed by those who were privileged to have him as a friend.

ALKALI DIVISION

New Playing Fields

Some time ago the very considerable plant extensions planned for the Winnington and Wallerscote area caused concern among the athletically minded folk of mid-Cheshire. It meant to them the invasion of their playing fields—a dear sacrifice to industrial expansion.

Reparations, however, are being made in full, and work was started a year ago to convert Moss Farm, the most convenient open space in the vicinity, into the new Alkali Division Sports Ground. Although hampered by present restrictions on building the venture has progressed well, and already the I.C.I. Alkali Football Club has transferred itself, its dressing-rooms and stands to the new site. The new grounds will have every facility for athletic competitions. There will be a grass track laid on a foundation of cinders; special jumping facilities with run-ups to the long jump and the high jump made in the "En Tout Cas" material as laid for the Olympic Games; and pits of similar construction for discus and shot throwing.

Altogether over 35 acres of the old playing fields will eventually be swallowed up, but in return the new grounds will cover 55 acres, exclusive of the land on the outskirts. This increase has been necessitated by the ever-growing numbers of employees in the Division and will, at the same time, provide opportunities for more inter-Divisional competitions and athletic activities in general. As well as the many pitches already laid, there is still ground available for some tennis courts, if these should be needed in the future, and for an attractive entrance planted with trees and shrubs.

Birthday Honours Award

It was a happy coincidence that on the thirty-third anniversary of his joining Brunner, Mond & Co. Ltd. Mr. J. E. Shaw should have found his name in the King's Birthday Honours List as having been awarded the M.B.E. In gaining this distinction Mr. Shaw has quickly followed his late chief, Mr. J. J. Grundy, who received a similar award a few years ago.

Ted Shaw began his career in the Sales Department, Winnington, as a youngster of 16. Rather more than three years ago he was promoted to be Assistant Distribution Manager of the Alkali Division.

BILLINGHAM DIVISION

Mr. W. M. Gyles

Head of the Civil Design Section and the man who in 1920 was responsible for the initial surveys and the layout of Billingham factory, Mr. W. M. Gyles, retired on 30th June after more than thirty years' service.

Starting with the Company at Northwich in January 1920, he came to Billingham in April of that year, since when Billingham has grown to what it is today under his care.

In 1930 he went to Mosceto Island, New South Wales, Australia, to investigate possible sites for the construction of a second "Billingham" in Australia; but the project finally was dropped. Later, at the request of Alkali Division, he returned to South Australia in 1932 to find a suitable site for an alkali factory. In this he was successful, and the factory erected on the site he chose has been in production for many years.

Civil engineering work on all Billingham projects (including many Ministry factories), from initial survey to completed plant, was the responsibility of Mr. Gyles. With Dr. Higson he also had a big share in the siting at Wilton of the new works at present under construction. One of the many projects to come under the personal supervision of Mr. Gyles was the design of the new chimney stack at the Boiler Plant. This imposing edifice, some 130 feet higher than Nelson's Column, will always be referred to by members of the Civil Section as "The Gyles Stack."

DYESTUFFS DIVISION

Photographic Awards

With the striking photograph reproduced on the back cover, Mr. Juris Benjamins, an associate member of the Royal Photographic Society has won the premier award—the Blackpool Corporation Trophy—in the Blackpool Photographic Society's Open Exhibition. Entries were received from Australia, Canada, Czechoslovakia, Germany, Hungary, India, Italy, Portugal, South Africa, Spain, Sweden, and U.S.A.

Mr. Benjamins' winning print, which shows two trees silhouetted against the sun in a snowy landscape, was taken in December 1949 at St. Moritz in Switzerland.

Mr. Benjamins, who is a native of Latvia and a graduate of Riga University, took up residence in this country as a consequence of the war. He joined the Dyestuffs Division's Research Department just over two years ago. He is an expert photographer, both in black and white and in colour, and before coming to England had many successes in Continental exhibitions.

Mr. W. Furness Brown, A.R.P.S., of the Dyehouse Department, was also awarded two certificates of merit at the same exhibition. He is well known among the photographic societies as a lecturer on photographic technique and is a member of the Executive Council of the Lancashire and Cheshire Photographic Union. Both Mr. Brown (who has been with the Company 36 years) and Mr. Benjamins were guests of the Blackpool Society on 13th May, when they received their awards from the hands of the mayor.

Apprentice Wins Gold Medal

A Huddersfield Works apprentice has recently had the rare distinction of being awarded by the Huddersfield Engineers' Association a Gold Centre Medal because of unusual ability displayed as a student at the Huddersfield Technical College. He is Mr. Gordon Sykes, now junior technical officer in the Drawing Office.



Mr. Gordon Sykes

Mr. Sykes joined the Company in 1943 at the age of 15½, and was indentured as an electrical apprentice; he obtained the National Certificate of Electrical Engineering in September 1947 and, after completing his apprenticeship, obtained his Higher National Certificate in October 1949. He was awarded the George Ainley Prize for the best apprentice of 1948. The purpose of this prize was described in the May issue of the *Magazine*. The Gold Centre Medal has now been given for his work at the Technical College during the 1948-9 session.

The award was presented by Mr. G. B. Jones, General Works Manager, at a ceremony held in Huddersfield Works on 6th June.

GENERAL CHEMICALS DIVISION

Widnes Centenary Celebrations

On the week-end of 9th and 10th June General Chemicals Division acted as hosts at centenary celebrations of the founding of the chemical industry at Widnes.

The celebrations began with a luncheon held at the Widnes Recreation Club attended by more than 200 people drawn not only from the ranks of I.C.I. in Widnes—workers no less than staff—but also from other Widnes chemical firms. Also present were the Mayor and Member of Parliament for Widnes and the members of the town council. The toast, "The Town and Industry of Widnes," was given by Sir Frederick Bain, M.C., Deputy Chairman of I.C.I.



The Widnes Centenary Celebrations in full swing

After expressing the regret of Lord McGowan that he was unable to be present, Sir Frederick began with a brief historical survey of the uncertain world situation which formed the background against which the pioneers of industry pitted their genius and enterprise one hundred years ago. He recalled the unrest of those days—Russia absorbed Poland in 1847—and drew a laugh when he reminded his audience that in 1850 Britain blockaded the Piraeus to avenge assault on a British subject whose name, strangely enough, was Don Pacifico. He then went on to give a vivid sketch of the character and enterprise of the men who founded the Widnes chemical industry: men whose names—Hutchinson, Deacon, Gossage, Gaskell and Muspratt—are household words today and have served to make Widnes famous throughout the world. His memorable address, which made a deep impression, is given in "Information Notes" on page 248.

The Mayor of Widnes, Councillor Ludden, replied to the toast in a spirited manner, and the audience enjoyed the cut and thrust of his comments and pertinent remarks about present-day conditions.

The following day, Saturday 10th June, was one of brilliant sunshine throughout with just that freshening breeze which lent vigour to the enjoyment of all. The official opening of the celebrations was at 2 p.m., when Mrs. Lutyens, wife of Mr. W. F. Lutyens, the Group Director, cut the tape across the formal archway leading to the recreation ground. And what a sight the grounds were!

Flags fluttered bravely in the breeze from the many marquees soon thronged by vast crowds. That afternoon 15,000 Widnesians attended the celebrations, which lasted until 11.30 p.m., winding up with a brilliant firework display. In the centre of the field was a circus ring, and here the animals and their masters performed under a cloudless sky, across which floated the coloured gas balloons ascending in an unending stream on their distant journey, each one bearing the name of its sender. Scarcely more than a stone's throw

from the circus was a fun-fair with its swings and roundabouts open to the enjoyment of the most anxious parents. Provision was made for children to be looked after and entertained by Boy Scouts in a special enclosure. And all stood the marquees, where beer and ices, buns and tea were on hand to refresh and invigorate.

A memorable day was spent by all, and in conclusion it is only fitting that mention should be made of that small army of workers (their outing came later) who continued to man the plant and drive the cars—men without whose loyal support there could have been no Widnes Centenary Celebrations.

Centenary Prizes

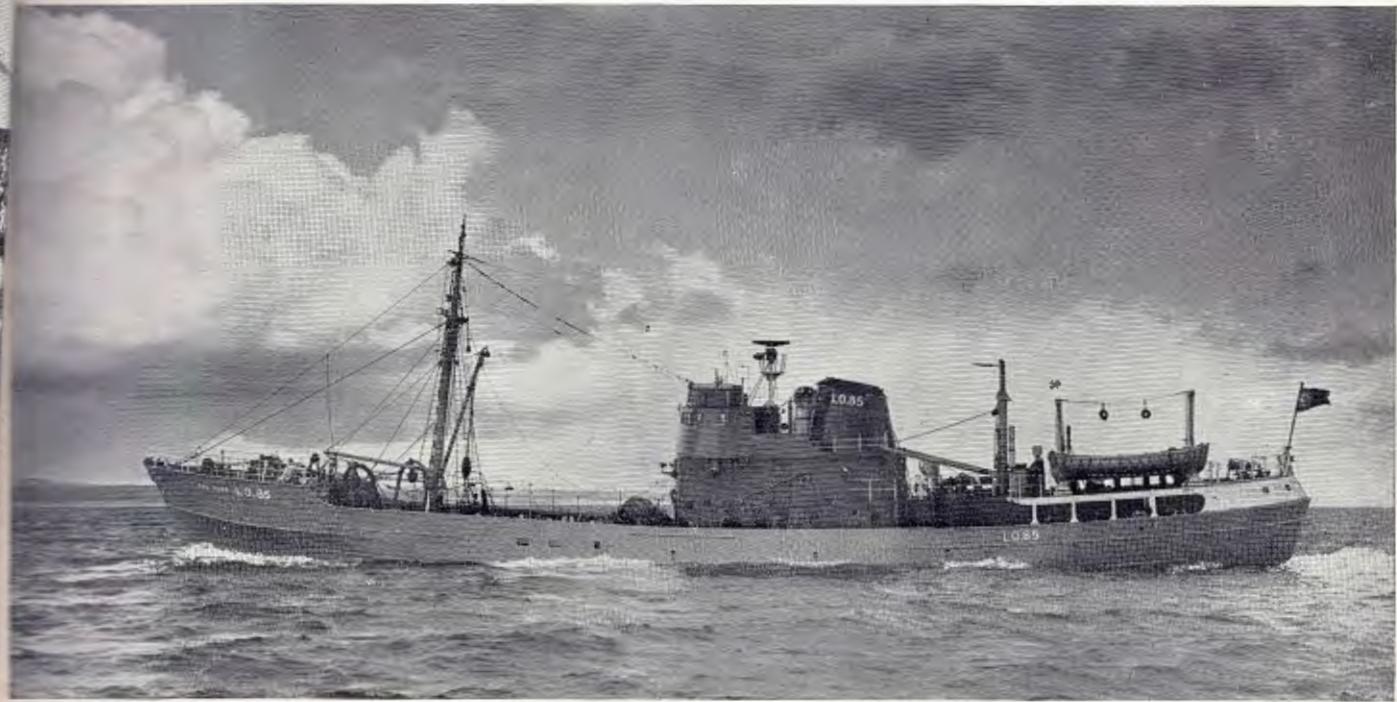
As a reminder of the Centenary Celebrations I.C.I. presented prizes to be awarded annually to pupils at the Deacon Grammar School and to students at the Technical College. Sixth-form boys and girls at the Technical College will compete for two separate prizes for English essays, and at the Technical College one English essay prize and one chemical engineering prize will be open to all students.

METALS DIVISION

Light Alloy Trawler

The Waunarlwydd Works of the Metals Division helped build a steam trawler with an unusually high proportion of aluminium.

The *Red Rose*, built by John Lewis and Sons Ltd. (of Fleetwood) for the Iago Steam Trawler Co. of Fleetwood, had 27 tons of light alloy material from this works. Aluminium alloy sheets and extrusions were used in the construction of the funnel, wheelhouse and icebox, as pound boards on the deck and to make up the lining, shelving and partitions of the fishroom. The funnel of the galley and the boiler and liver-treatment room were also insulated and covered with material in this alloy.



The Red Rose. Twenty-seven tons of light alloy were used in her construction.

A good idea of the pleasant appearance created by the use of this material may be gained from this photograph; it is easy to imagine the advantage light alloy has over wood in the important matter of keeping the ship scrupulously clean.

Birmingham Marksmen

As might be expected, some of those who work in the Ammunition Section of the Metals Division are handy and indeed expert shooting men. Among their number is Mr. T. J. Knight, of Proof Department, Kynoch Works. At the National Scottish Small-bore meeting held in Glasgow at the end of May, Mr. Knight won the Charles R. E. Bell Challenge Cup. Taking 10 shots each at 25, 50 and 100 yards' range, he scored 299 out of a possible 300.

As a member of a team of four representing the City of Birmingham Rifle Club—two others of whom (Messrs. A. D. Skinner and J. Hall) were also Kynoch men—he had a share in winning the New Zealand Shield for marksmanship in the 100 yards team competition. The whole team dropped only 9 points between them, and Mr. Knight scored 200 points out of a possible 200. Another success of this team was its winning of the Lord Forteviot Cup for the fifth successive time.

Mr. Knight, who took up shooting in 1932 with the Walthamstow Ensign Club, is an authority on ballistics and is also keen on woodwork, especially the fashioning of gun stocks.

A Versatile Athlete

Behind the news that in 1950 Miss Gladys Clarke remained the Midland Women's Javelin Champion lies the story of a versatile and plucky athlete.

Miss Clarke, who is employed in the Accounts Department of Amal Ltd., took an early interest in athletics, and joined the well-known Birchfield Harriers Club at the age of 12, concentrating on sprinting and jumping. Three years later she came second by a margin of an eighth of an inch in the shot putt championship, second in the senior Midland long

jump championship and third in the high jump championship. The following year she won the Midland discus title.

In 1945 she won the javelin title at the British championships, the Midland javelin title and a Midland badge in the Territorial match at Oxford. Then came a big disappointment. An accident while playing netball caused a spinal injury which took nearly two years to clear up. However, with only three weeks' training, she competed in the British javelin event in 1947—and was only just beaten.

The Olympic Year 1948 found her throwing as well as ever, and she came within a foot of the Midland record and was second in the British javelin event. These performances gained for her the cherished ambition of all women athletes—an international badge and a place in the British Olympic team.

Miss Clarke held the Midlands javelin championship title in 1949 as well as this year.

Awards to Footballers

The annual presentation of trophies arranged by the Birmingham Youth Football Association was specially interesting this year to footballers employed at the Kynoch Works of the Metals Division.

Among the recipients of last season's trophies was Jeff Stokes, who is employed in the Tool and Gauge Inspection Department, Witton; he was selected to receive the Special Medal given every year to the player in the junior leagues outstanding for consistent good play and general conduct throughout the season.

It is interesting to record that two other Kynoch players have been similarly honoured in the past—K. Steward of the Senior Division and J. Prescott of the Juniors.

NOBEL DIVISION

Reunion Dinner

At Ardeer Recreational Club on 30th May and 6th June, men and women who once worked in Ardeer came back from

retirement to be entertained to dinner by the Division management. Wives accompanied their husbands, and in all over 500 guests accepted invitations.

Members of the Division board (including the chairman, Dr. J. W. McDavid), members of Ardeer Factory and departmental management, and members of the factory Works Council were also present. The reunion dinner constitutes a new precedent and was much appreciated by all.

Anti-waste Quiz

In recent months interest in all factories has been focused on the elimination of waste by means of an anti-waste quiz competition in which 1100 people entered—over 10% of those eligible. The answers to the questions required considerable knowledge of the problems involved.

There was a first prize of £25 won by Mr. W. Millar (Propulsive Dept.); a second prize of £10 was won by Mr. T. Halliday (Commercial Dept.); and a third prize of £5 was won by Mr. W. Armour (Trades Dept.). In addition, prizes of £3, £2 and £1 were awarded for the best entries from each factory and from every Ardeer department.

Displaced Rabbit

In Sabulite Factory a rabbit has reared her young in a nest entirely exposed to weather and curiosity—a most unusual phenomenon. The nest is at the bottom of a sixty-foot cliff near building R3.

An old sack was provided by one of the factory workers to give some protection, and the family of young rabbits grew. The doe appreciated—or at least did not resent—human aid, and, although one of the family died and two others just vanished, five grew to a stage when they could hop around on their own.

Scottish Rifle Champion

Mr. R. J. Ramsay, who works in the Engineering Section, Research Department, at Ardeer, is the new Scottish Small Bore Rifle champion. When he came back from the Scottish National Shoot at Rouken Glen in the second week in June he had added considerably to his collection of trophies.

In the principal event with a total of 792 he defeated a former triple holder of the Scottish title, Mr. A. C. Smith of the Glasgow Police, by one point; and besides gaining a championship he brought with him the Haig Memorial Cup. Among other awards he collected the Nestle and Anglo-Swiss Milk Challenge Cup and the Bonehill Challenge Cup for Aggregate Scores. He also won the Norman Headland Memorial Any Sights Competition. Altogether Mr. Ramsay had gained four cups, two plaques and an international medal when he came home from Rouken Glen.

At the age of 28 Mr. Murray, who has been shooting for only four years, is the youngest man ever to have held the Scottish championship. He is a member of the Irvine Rifle Club, and earlier in the season he won the Ayrshire Cup.

Lord McGowan visits Tuckmill

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retirement to be entertained to dinner by the Division management. Wives accompanied their husbands, and in all over 500 guests accepted invitations.

Members of the Division board (including the chairman, Dr. J. W. McDavid), members of Ardeer Factory and departmental management, and members of the factory Works Council were also present. The reunion dinner constitutes a new precedent and was much appreciated by all.

Anti-waste Quiz

In recent months interest in all factories has been focused on the elimination of waste by means of an anti-waste quiz competition in which 1100 people entered—over 10% of those eligible. The answers to the questions required considerable knowledge of the problems involved.

There was a first prize of £25 won by Mr. W. Millar (Propulsive Dept.); a second prize of £10 was won by Mr. T. Halliday (Commercial Dept.); and a third prize of £5 was won by Mr. W. Armour (Trades Dept.). In addition, prizes of £3, £2 and £1 were awarded for the best entries from each factory and from every Ardeer department.

Displaced Rabbit

In Sabulite Factory a rabbit has reared her young in a nest entirely exposed to weather and curiosity—a most unusual phenomenon. The nest is at the bottom of a sixty-foot cliff near building R3.

An old sack was provided by one of the factory workers to give some protection, and the family of young rabbits grew. The doe appreciated—or at least did not resent—human aid, and, although one of the family died and two others just vanished, five grew to a stage when they could hop around on their own.

Scottish Rifle Champion

Mr. R. J. Ramsay, who works in the Engineering Section, Research Department, at Ardeer, is the new Scottish Small Bore Rifle champion. When he came back from the Scottish National Shoot at Rouken Glen in the second week in June he had added considerably to his collection of trophies.

In the principal event with a total of 792 he defeated a former triple holder of the Scottish title, Mr. A. C. Smith of the Glasgow Police, by one point; and besides gaining a championship he brought with him the Haig Memorial Cup. Among other awards he collected the Nestle and Anglo-Swiss Milk Challenge Cup and the Bonehill Challenge Cup for Aggregate Scores. He also won the Norman Headland Memorial Any Sights Competition. Altogether Mr. Ramsay had gained four cups, two plaques and an international medal when he came home from Rouken Glen.

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went to Mr. J. H. Weatherall of Wyken, Coventry, for a 7 lb. brown trout caught in Thorpe Malsor Reservoir, Kettering.

'Terylene' Mosquito Nets

During the past few months mosquito nets made from 'Terylene' have been undergoing extensive tests in the Far East. Some of the nets were used for covering babies' cots, and a report on one such test reads:

"This net has stood up to normal use in a very satisfactory manner. It has not shrunk as a result of washing, and I have no complaints. The makers may be deservedly congratulated. It has withstood attacks by baby's teeth, nails and general assault, and at no time has it failed to stand up to its aggressor; and not even by the appearance of one single hole, beyond those already installed in its manufacture, has it given way."

Mr. Sam Rockett

Mr. Sam Rockett, the Plastics Division entrant for the *Daily Mail* Channel race in August, is now undergoing intensive week-end training at Folkestone under the direction of the well-known Channel swimmer Mr. Temme.

On a recent week-end he arrived at 6 p.m. on Friday, and although there was a strong breeze blowing with a fair amount of chop on the channel and a temperature of 49°, he went for an hour's swim that evening, covering about a mile and a half. Saturday morning he was up at 7 a.m. on a six-mile walk, later swimming for an hour before lunch. On Sunday he had the big swim of the week-end, lasting nearly three hours.

He has already done a fourteen-hour swim and came out of it, according to his trainer, improved both in strength and style. His resistance to cold water is considered to be well up to standard.

SALT DIVISION

Ocean-going Vessel calls at Winsford

The centuries-old salt industry in Winsford passed another milestone in its history when the Dutch coaster *Despatch*, a motor vessel with a carrying capacity of 250 tons, berthed at South Works on 12th May for a cargo of Winsford salt. Though millions of tons of salt have been carried by Salt Division craft from Winsford Works to Liverpool, Manchester and Runcorn for transhipment, this is the first time that salt has ever been loaded directly into an ocean-going vessel at Winsford.

The passage of sea-going vessels like the *Despatch* along the Weaver to Winsford has been made possible by the substitution of a modern bridge for the old Hartford stone bridge—a project conceived long ago but realised only in the past few years.

"This is Salt"

The film *This is Salt*, which was made last year by the I.C.I. Film Unit about the Salt Division, has been chosen as part of the British entry in the International Festival to be held at Venice this year. It was selected from a record entry in the documentary class, most of which came from industry.

Bowling Champion's Faultless Display

In each of the two inter-county crown green bowling matches between Cheshire and Lancashire which took place concurrently at Lostock Alkali Social Club and Newton-le-Willows on 20th May, the Winsford saltmen had a representative.

Arnold Bebbington (West Works), the present Cheshire and All-England Amateur Crown Green champion, who opposed one of Lancashire's best bowlers in J. Featherstone, produced at Lostock an almost faultless display worthy of a reigning champion and was a comfortable winner at 21-13. Dick Morgan (Dockyard), a member of the Wharton Bowling Club, beat W. Bennett at Newton-le-Willows 21-17.

Motor-cyclists' Award

To be accepted as a competitor in the Scottish Six Days' Trial, one of the foremost events in the motor-cyclists' calendar, is a distinction in itself, and to receive at the end of it a second-class award signifies an achievement of which any amateur motor-cyclist may be proud. In attaining this honour at the trial, held during the period 24th to 29th April, Mr. Tom Copeman (Drawing Office) has realised one of his cherished ambitions in the motor-cycling world.

The Scottish Six Days' Trial, designed to apply the severest test to rider and machine alike, covers approximately 1200 miles, including some of the roughest terrain in Scotland. As its name implies, it occupies six days. 134 competitors took part in the trial this year, among whom were some well-known foreign riders from countries as far away as Austria and Czechoslovakia.

Mr. Tom Copeman has been a keen amateur motor-cyclist for a number of years, being especially active in reliability and sporting trials. As secretary of the Winsford and District Motor Club he has played a leading part in organising many successful competitions in the Mid-Cheshire area.

* * * *

Magazine for Retired Employees

In accordance with a decision announced at the last meeting of the Central Council, the present arrangement by which copies of the *Magazine* are issued free to all those drawing pensions from the Workers' Pension Fund will in future be extended, on application, to include persons not in receipt of a pension but who would have been drawing a pension had they been members of the Fund. Applications from those affected should be submitted to Works Labour Officers.

* * * *

The September Magazine

In the September issue of the *Magazine* we give the story of two unusual I.C.I. subsidiaries, both of them in Scotland. In the case of the Portland Glass Company Ltd., each principal stage of the process of making glass bottles is explained in a series of sixteen fine pictures taken by Charles Wormald, manager of the Kynoch Press studio. This is followed by the story of Scottish Agricultural Industries Limited, an extensive merger of old-established merchants trading with the Scottish farmer, buying his produce for seed and selling him fertilizers, feeding stuffs and machinery.

Next comes a whiff of the sea in a breezy but informative article from Mr. Ronald Farquharson, I.C.I. shipping manager, who writes on the prospects of a career in the Merchant Navy. Dr. Alfred Baldwin then contributes perhaps the liveliest and most audacious article he has yet written for us—on the iniquities of poker dice. We end with Mr. Harry Townley of Buxton describing the hobby of building a model railway. This article was displaced from the August issue to make room for more news.



The manufacture of SHOTGUN CARTRIDGES

THE ELEY-KYNOCHE shotgun cartridge, well known to all who handle a gun, embodies over a century of tradition, research and experiment on the part of a large number of manufacturers. As the manufacture and sale of breech-loading cartridges developed, these individual firms tended to absorb each other and amalgamate. In 1918 all of the remaining individual makers joined together under the name of Explosives Trades Ltd. (later changed to Nobel Industries Ltd., which subsequently became part of Imperial Chemical Industries Ltd.). In 1926 the manufacture and loading of shotgun cartridges was centralised and located at Witton.

Of the two firms under whose joint names shotgun cartridges are now sold that of Eley had the longer history. As far back as 1828 the Eley business was already a going concern. Established at a period when the evolution of the modern gun was in its first stages, the business of manufacturing a considerable variety of cartridge cases, percussion caps, powder, wads and, at a later date, cartridges was closely associated with each successive advance in gunmaking—from flint lock to percussion muzzle-loader, muzzle-loader to breech lock and cartridge, pin fire to central fire.

The Kynoch business can be traced back to the middle of the nineteenth century, when George Kynoch interested himself in percussion cap manufacture, a trade which was a speciality of Birmingham manufacturers. In 1862 the business was brought to Witton and under George Kynoch expanded to other ammunition products. Manufacture of sporting cartridges at Witton began in 1865, and in 1884 the business was formed into a limited liability company. Like Eley, Kynoch did considerable pioneer work in the development of sporting cartridges.

The present-day shotgun cartridge consists of lead shot, powder to propel the shot, a percussion cap to ignite the powder, and suitable wads between powder and shot and over the shot. These components are

contained in a case made to fit the gun. Simple in appearance, the cartridge is really a precision job in which over 120 manufacturing operations play their part. Before we look at some of the various stages in its manufacture let us examine the diagram showing a cross-section of a cartridge and see how it is made up.

The head of the cartridge, shaped to fit the chamber of the gun, is made of brass reinforced with a steel cup. To the head is assembled, by means of a base wad made of compressed paper, a paper tube to hold the charge of powder, the shot and the various wads.

The rapid burning of the powder forms a gas which propels the shot at a high velocity through the barrel, but before it can fulfil its function the powder has to be ignited. This is effected through the ignition system contained in the brass head—consisting of the cap chamber, the anvil and the percussion cap.

The brass head is pierced with a central hole in which is fixed the brass cap chamber holding the percussion cap and the anvil. The percussion cap is made of soft copper and holds the igniting mixture, a very small but accurately measured quantity of a highly sensitive explosive. Into the open end of the cap, with its point embedded in the ignition mixture, fits the brass anvil, so called because it is against this that the ignition mixture is crushed when the gun trigger is pulled and the striker hits the flat top of the cap. This immediately ignites the mixture and the flame rushes through the flash hole in the cap chamber and fires the main powder charge.

Directly this happens, gas is produced at very high pressure, so that the turnover of the cartridge is opened and the wadding and shot charge forced up the barrel of the gun, the wads in the barrel forming a check to the escape of the gas and undue loss of pressure. By the time the shot pellets reach the muzzle of the gun they are travelling at about 1400 feet per second.



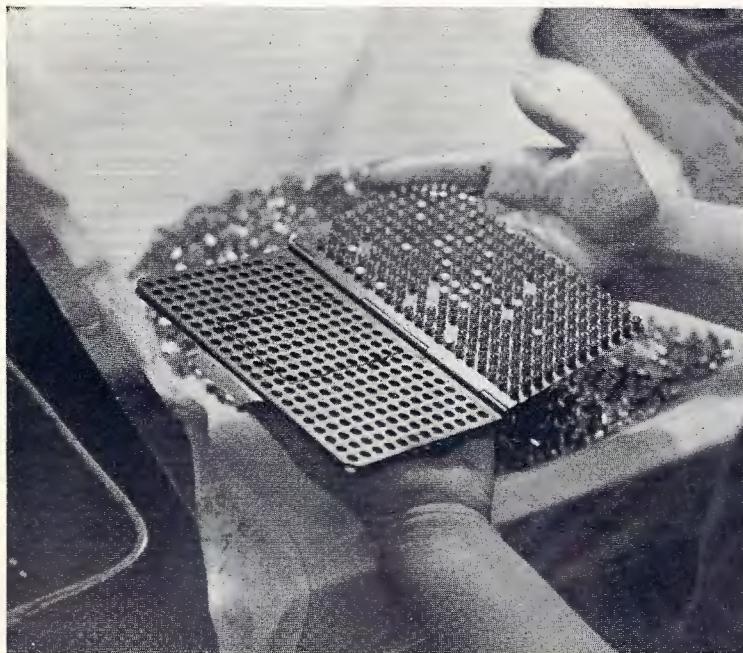


1 Brass strip from the rolling mills at Witton is fed through the machine seen in this picture, which cuts discs from the strip and presses them into cups. When finally shaped, these cups form the head of the cartridges.

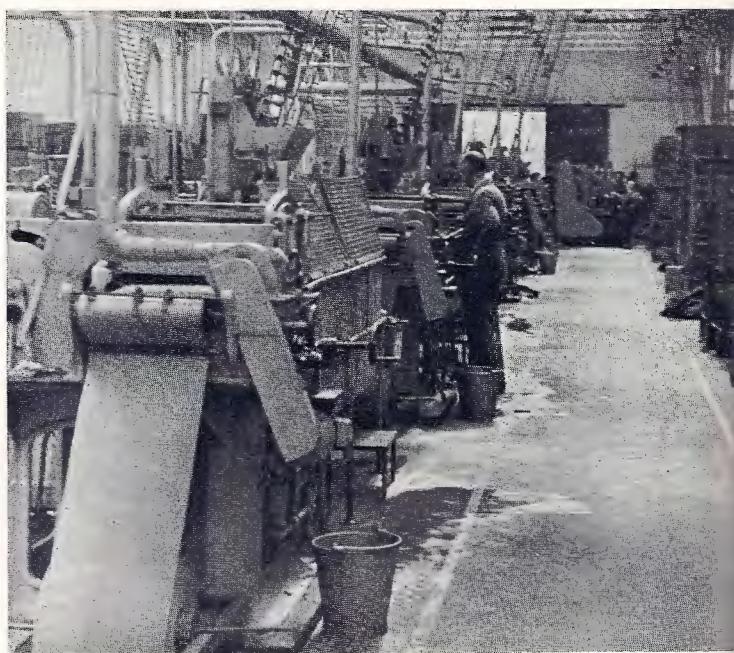


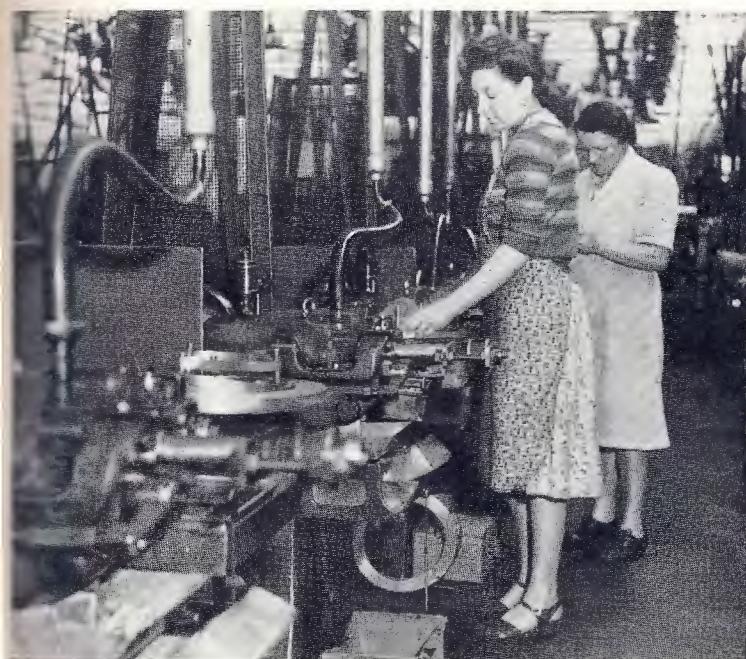
2 Brass cups (shown on the left of the photograph) are being fed into a machine which at the same time takes in the reinforcing steel cups (shown on the right) and assembles them together.

5 All percussion caps are carefully examined before they leave the priming department. They are here seen being shaken into the holes of an inspection tray, where in the hands of an expert defects are quickly traced.

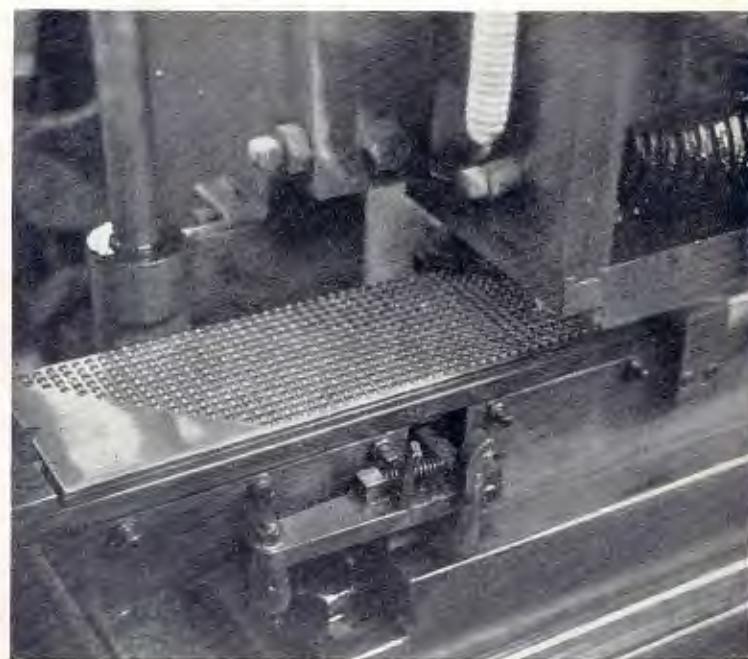


6 The paper cases start life as tubes, made by rolling sheets of paper against a revolving brush moistened with adhesive. The tubes are automatically transferred from the machines to slowly moving conveyor chains, upon which they begin the drying process.





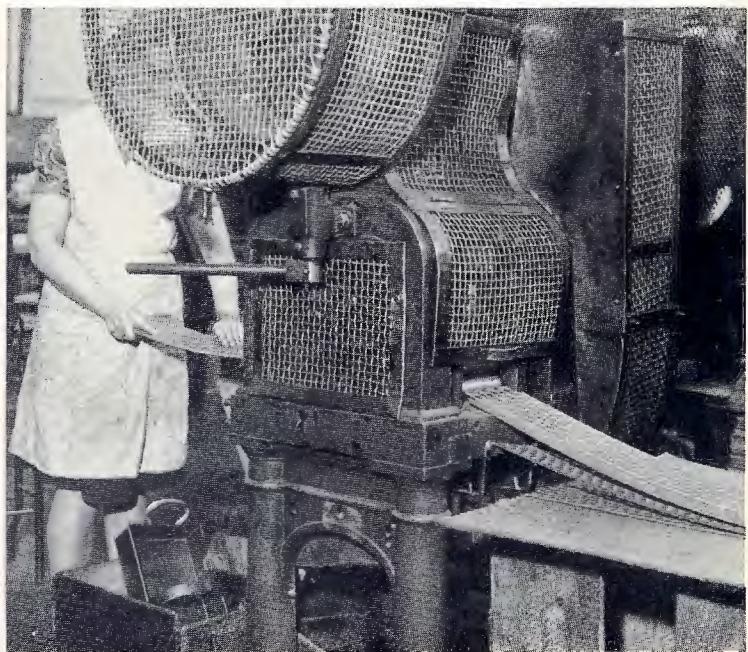
3 The complicated process of making the anvil is performed by the highly technical machines shown here. A strip of brass is fed horizontally through the machine, which produces the minute anvils at such a rate that they have to be blown off the tools under a blast of compressed air.



4 Here is an intermediate stage in the manufacture of the percussion cap. A small copper cup, about $\frac{3}{16}$ in. diameter, is filled with a precisely measured minute quantity of the highly sensitive explosive which fires the main charge. The mixture in the cups is consolidated by this machine under heavy pressure.



7 Lengths of tube are kept here in a controlled atmosphere for about a week to ensure that they have the correct dimensions after polishing. They are then cut to the required length.



8 Wads are here being punched out of strips of card. One unique feature of I.C.I. cartridges is the air cushion wad, consisting of a short paper tube of which the ends are crimped over a card wad. This air cushion wad, with a card wad on each side of it, lies between the powder and the shot.



9 We come now to the highly complicated process when all the different components illustrated on the previous pages are assembled by machinery. After this the completed case is ready, except for finishing and inspection, to receive the powder and shot.

10 Every case has all its measurements checked to ensure a correct fit in the gun and then undergoes complete visual inspection; defective cases are immediately rejected. Here all the cases are sorted by hand and prepared for inspection.

13 Empty cases are fed into this machine. The pipes on the right deliver to each case the powder charge, an over-powder wad, an air cushion wad, card wad, the charge of lead shot and an over-shot wad. Finally, the tube end is turned over to secure the contents.

14 Girls are feeding loaded cartridges on to an endless conveyor belt which carries them to the dipping tanks for treatment with waterproofing solution. This is the last stage in manufacture.



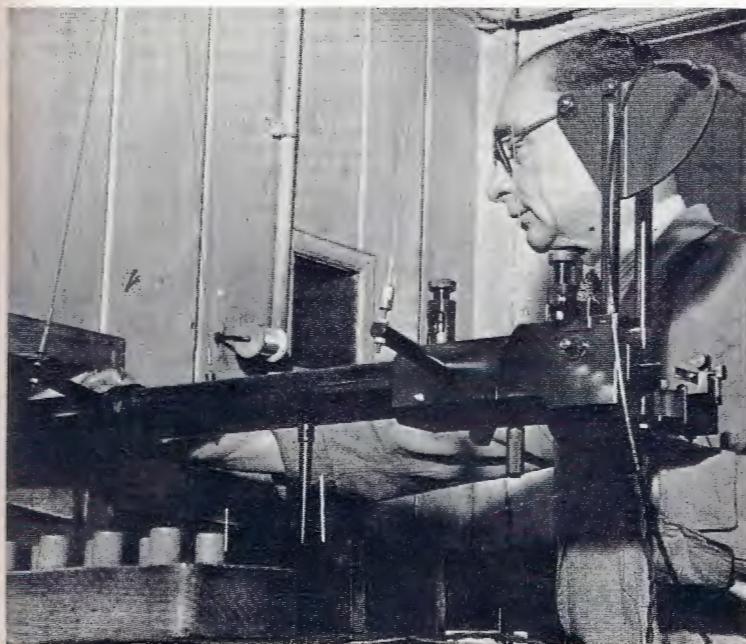


11 This is a stage in visual inspection. Each case is closely examined as it is fed into the printing machine, where information about the type of cartridge is printed on the paper tube.



12 To allow the ink to dry after printing, these cases are fed on to a large rotary table, from which they are collected in scoops of 100 and transferred to boxes ready for loading.

15 An independent Proof Department keeps a continuous check upon the quality and performance of the cartridges produced. Out of every batch of cartridges a certain number is selected at random for test by firing through the proof pendulum gun shown above.



16 The finished cartridge, made up of some fifteen or more different materials, is accurate in certain dimensions to as little as half a thousandth of an inch. After a final visual examination the cartridges are packed in cartons and cases and despatched to all parts of the world.



The English

By Kevin FitzGerald
(Dublin Manager, I.C.I. (Export) Ltd.)

THE IRISH—only heaven knows why—seem to have some kind of secret fascination for English people. Once the island had been discovered by its next-door neighbour (the Romans never went there—they knew better!) and William Caxton had returned to Westminster with his dangerous little printing press, the flood of books, pamphlets and letters about the Irish as the English see them began. This flood began as a flood—there was never a time of trickle—and is still in full spate. There are thousands of volumes mouldering on shelves all over the world with such titles as "With Rod, Rifle and Rucksack in Roscommon," "An Archaeologist in Athenry" or "Quiet Moments among the Irish." Such books are always the first sign of English interest. The second crop ("Fire and Sword in Connemara") marks the acquisitive or colonial stage and leads imperceptibly to the main harvest—the quest for comic relief. Of this Ireland has proved an inexhaustible mine.

Geraldus Cambrensis was the first to write about our funny little ways. He couldn't speak English himself because there



"God bless the feet that brought you to Ireland!"



Illustrated by A. R. Whitear

wasn't any then, and he could not get his Welsh tongue properly round the harsh French of the Normans. But that didn't stop him having a good laugh at the native effort; and why should it?

But the FitzGeralds and the Butlers started the only genuine endless soap opera, "Let's have a look at the Irish." When William the Conqueror had given all the jobs there were to all the boys who had earned them, these diminutive barons, with their miserable little followings of knights, had had to be left out. It was left to King Henry to point out to them that, across a short day's sailing of sea, there was a good deal of bog which would occupy their spare or farming time, and large numbers of queer natives, or "Kerns," who ran about in saffron kilts, were said to be a bad-tempered and quarrelsome people, and would probably be glad to arrange for certain periods of battle practice under active service conditions. How right King Henry was! But even that wise king had overlooked something, or perhaps he just didn't know. There wasn't much talk in those days of secret weapons; the invader just killed everything in sight and settled down happily on the

In Ireland



"There couldn't be a skin like that . . . or eyes 'put in with a sooty finger' anywhere else in the world"

vacated land. Thus the Irish secret weapon lay all unsuspected then, as it does still, in the hearts and minds of all the inhabitants of all the thirty-two counties which make up the present-day republic of twenty-six counties and the six-county part of the United Kingdom. The weapon is called variously charm, blarney, a queer fascination, or (but only by the Irish themselves) just plain "cod." The first to fall were the FitzGeralds, who became, as is said in Ireland, more Irish than the Irish themselves, and graduated through the centuries to their present state in which it is said that the Irish don't like them and the English won't have them.

But, alas and alas, what happened to the FitzGeralds and the Butlers didn't stop there. It went on happening to each new invasion wave. After the fire and sword (or battle practice) came everlastingly the settlement and the reappropriation of land. And in one short generation there was the son of the invader, with a stronger brogue than anyone else in the parish, a curious habit of talking about the English as if that proud race had just been discovered on an island in the Pacific, and with a love for his natal bogs, hills, soft mists and pastel lights

and shades surpassing the love of women. And those—ah, those! There never was on land or sea, there could never be anywhere in the world, said these first-generation Irishmen, a girl like an Irish girl. There couldn't be skin like that, or colouring like that, or eyes "put in with a sooty finger" (as all true Irish eyes are) anywhere else in the world. And the young men were right, and they made love in the proper Irish way as they had been taught by their nurses, grooms and the gentle climate, and they married these goddesses. The job was in the bag.

Now, when the English go anywhere else they do none of these things, but they have been doing them in Ireland for hundreds of years. Which is why nearly every true-born Englishman has an Irish grandmother (so has every American; but that's another story) and is prepared to say "It's only the Irish, don't mind it" whatever the inhabitants of this island, in their inscrutable perversity, may choose to do. That is why when the Irish declare that twenty-six thirty-seconds of themselves is a free and independent republic the English say "Of course" and give them the parliamentary vote in England.

That is also why when six thirty-seconds of the same curious country, running absolutely true to the same native form, says "Never shall we be parted from the motherland" the English say "Of course" and give them a Governor-General! In six hundred years the English have learned that they can do anything with the Irish if they don't order them about, and the Irish have learned that the English will put up with almost anything if you pretend not to like them. The system took both sides all those centuries to work out in detail and has only been put into full operation since the second world war.

Nowadays from May to September one-quarter of the resident population of the Republic consists of English families on holiday. There is nowhere to go but plenty to see. It is usually pouring with rain, but only the soft Irish rain that never soaked a shirt or caused a cold, and there is all the food and drink that anybody could want. And there is the secret weapon going full blast all the time. This is switched on as the boat draws into the quay, and the first rays strike home as the first passenger descends the gangplank.

"Welcome to Ireland, sir! Is it a passport? Now, what would you be wanting with a passport in Ireland?"

In a moment the passenger is surrounded by smiling porters, smiling customs men, smiling taxi-drivers. He is smiled by train or car into Dublin, smiled into his hotel, smiled outside a couple of drinks, smiled to a table and loaded with fillet steaks, and finally smiled into bed. In these radiant circumstances the visitor is not inclined to be over-critical, and if he is he can soon be smiled out of that. Many visitors are astonished by getting wholly unexpected replies

or services to quite simple requests. They remain blissfully unaware that their English accent is just as strange and incomprehensible to the Irish as say a strong Dublin gutter brogue is to them.

But the Charm is everywhere. It undermines the visitor equally on the long, lonely Western road or at the box office of a cinema. It will come at him in country pubs—"A glass of stout to take the cobwebs off your heart, sir"—or from a beggar woman in the streets—"God bless the feet that brought you to Ireland!" And there is no armour against it. Despite the poetry and the superb diction of the Irish, which are pure Elizabethan where they are not eighteenth-century, quite often the sentiments come from the heart.

And the visitor from England feels this. For centuries he has been taught that he must never speak to strangers, never give money to beggars except through a properly constituted organisation, and never tell a girl he loves her unless he has the ring in his pocket, or to mention the subject again once the ring is on her finger. He comes to Ireland and at once is caught up in arguments with total strangers in railway compartments, bars, hotel lounges, the very street itself. He loves it. He has promised faithfully not to mention politics or religion, and he plunges into both with the skill of the born orator. The stranger who is paying for his drink begins to abuse England, the English, and every square centimetre of the Empire. As in a dream the visitor discovers that this flood of treason is pouring from the mouth of one who has worn the King's coat on all the fighting fronts of all the wars there ever were. And he loves that, too. He listens to vilifications of

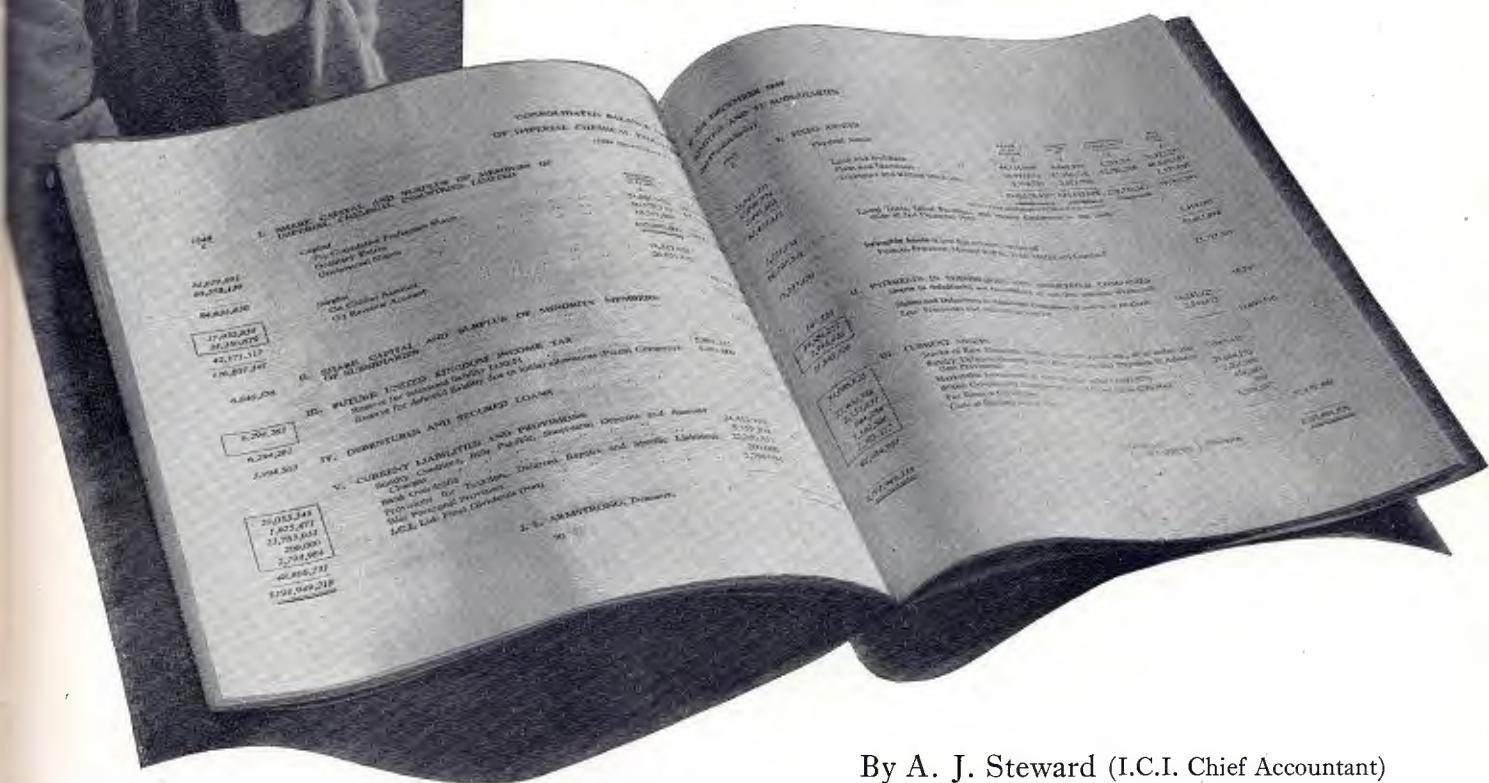
the English way of life and finds that his informant is the Member of Parliament of Blankshire home for a holiday and remembering the pit from which he was digged. And he discovers that in all probability half the people in his own street at home are related to some cheerful inebriate he has met in Carrick-on-Suir. He will certainly meet one or two distinguished citizens who, the talk running to England, will say "Do you know (for example) Stafford?" "Yes, indeed," replies the visitor. "Fancy you knowing Stafford!" or "Whereabouts in the town did you live?" Then a slow smile will come over the face of that distinguished citizen and he will sign for more drinks as with a happy reminiscent smile he begins. "It was during the Troubles, and the English captured me after a raid on the barrack at Cahirciveen. One night in the gaol at Stafford a man you wouldn't know called Andy O'Meara says to me, 'Doctor,' he says, 'Let's get the hell out of here!'"

Is it any wonder that, year after year, our visitors come back for more?



"A glass of stout to take the cobwebs off your heart, sir . . ."

Should My Son Become An Accountant?



By A. J. Steward (I.C.I. Chief Accountant)

ACCOUNTANTS have rightly been described as the doctors of industry. They are called in to advise from the pre-natal stage, during life, in times of financial illness, and where necessary, until final interment. They were originally concerned with the recording of past financial history, but the emphasis has now moved to the assessing of the present—and indeed the future—position. Today one finds few important companies which do not have at the financial controls qualified accountants, either to advise the management or as members of the board.

In my view it is extremely unlikely that a boy or girl who has no leaning towards figures, book-keeping, and accounts, as opposed to being a clever mathematician—which for some reason or other some people regard as one of the main qualifications for becoming an accountant—will make headway in the profession. The principal attributes of an accountant are common sense, integrity and an interest in the work; a flair

for spotting almost at a glance errors in a statement; power to understand the meaning of figures; and the ability to think clearly and be able to express these thoughts in simple statements.

If an accountant wishes to rise high in the profession, he will have to learn to memorise principles and facts culled during training, so that he can bring these to mind at the appropriate time as though they had been card-indexed. At the same time he must school himself never to reveal the secrets of the firm for whom he is working.

There is one important aspect of the accountancy profession which the following story may serve to illustrate. A grave-digger was discovered by the local doctor lying in a grave which he was digging, having had "one over the eight." The doctor exclaimed, "George, I shall have to tell the vicar about this occurrence!" And George replied, "Oh, doctor, don't do that! I think you might cover up this one mistake of mine—I've covered up many of yours!"

The moral is that if an accountant makes a mistake the error will nearly always—in fact I think one can say always—rear its ugly head at some future date. Absolute accuracy, so far as accounting is concerned, is therefore the order of his days.

Two ways are open to aspirants intending to follow accountancy as a career. The first method is to obtain a job as a junior clerk in the Accounting Department of a commercial firm, thereby gaining experience and knowledge while earning a living. Many expert accountants have started in this way and have risen to high posts. Today, however, with the multitude of problems with which an accountant has to deal, this method is becoming more difficult. It involves much leisure time spent in studying those branches of accounting which in most commercial firms are not met with in the ordinary course of work as a clerk.

On the other hand, there is no reason why an accounting clerk should not reach a responsible position and earn a good salary, provided he is prepared to apply himself assiduously to the work of acquiring accounting knowledge. It is also possible to take special training courses, both practical and by correspondence, and to sit the examinations of certain of the professional bodies (as will be seen later in this article) in order to attain the recognised standards of accounting essential for the more responsible jobs.

The second way is by entering a professional practising accountant's office as an articled clerk for a period usually of some five years (or less for a university graduate). In this way a thorough knowledge, both theoretical and practical, can be acquired of the principles of accountancy and the actual methods used by commercial and professional firms and companies. The theoretical knowledge is gained by continuous study of the various books on the subjects in preparation for examinations, and the practical knowledge by working as an assistant with experts in these subjects.

Once the accountant is professionally qualified he can use his knowledge in a variety of ways: as an audit clerk, managing clerk, or partner in a firm of practising accountants; on the staff of a commercial undertaking; or with local authorities or public bodies. Positions in these organisations such as chief clerk, cashier, assistant accountant, finance officer, chief accountant, secretary, treasurer, and finance director are open to him in due course, provided he possesses the additional qualifications which fit him for such posts.

There are four principal professional bodies in the accounting sphere in the United Kingdom, and four more which might be called specialised associations. I propose to consider briefly the regulations of each in turn. The period of service under articles where necessary is five years, which is usually reduced to three years for university graduates.

The Institute of Chartered Accountants in England and Wales and *the Society of Chartered Accountants in Scotland* are the two premier professional bodies. Membership can only be obtained by service as an articled clerk with a practising member of the body concerned and by passing the requisite examinations. In many cases a premium is asked which is normally returned as salary during the period of articles. To become articled the applicant must in the first case be over 16 years old (in the second case over 17) and have passed either the preliminary examination of the body concerned or an equivalent examination. The articled clerk has to sit in each case an intermediate examination, usually taken half-way through his articles, and a final examination.

The Society of Incorporated Accountants and Auditors'

regulations are similar to those of the first two premier bodies, except that approved professional service as an accounting clerk for a certain term of years can be claimed as an exemption from articles, although the Society's examination must be passed.

The Association of Certified and Corporate Accountants' regulations differ in that, although the examinations are similar, the Association provides for the examination without articles of accountants engaged in industry or commerce, who must have had at least five years of accounting experience.

The Institute of Municipal Treasurers and Accountants is limited in membership to persons who are employed in the finance departments of local authorities or certain public authorities, and who have passed the examinations as laid down.

The Institute of Cost and Works Accountants again is somewhat different, and the usual method of entrance is by working in the Cost Department of an industrial or commercial undertaking under the direction of a Cost Accountant, and by passing the examinations of that body, after at least three years' practical costing experience.

The Chartered Institute of Secretaries and the Corporation of Certified Secretaries allow clerks engaged in industry or commerce to sit their examinations and obtain their diplomas provided they are approved as potential members of these bodies and have had an appropriate period of experience in a commercial concern or a public authority. The examinations are somewhat different from those of the accountancy bodies, being on a rather more restricted scale so far as accounting, auditing, and taxation are concerned and rather more extensive in the subjects of secretarial practice, economics and law.

While these secretarial diplomas are not those which are normally taken by a person who is bent upon becoming a professional or commercial accountant, they are of considerable value as an adjunct to the accountancy diplomas, particularly if a person is desirous of becoming a Company Secretary.

On entering a commercial office the would-be accountant is usually interviewed by a senior member of the Accounting Department, and normally given some preliminary test so that the scope of his common sense and ability to tackle simple problems in mathematics can be judged. Generally speaking, he should have already passed School Certificate or Matriculation. If he is engaged he must expect to spend the first few months as a junior office boy, fetching, carrying and making himself generally useful in one of the many sections, of which the chief are the cashier's, the general accounts and the costing.

If he becomes a member of the cash section, he will be instructed in the system of payment and various matters dealing with cash and banking, such as the drawing of cheques for signature, the preparation of paying-in slips for banking, the method of recording transactions in a petty cash book, the preparation of salary and wages pay rolls, and so on. As he gains experience he may have charge of the petty cash book, cash book, bill book, or other records.

If, on the other hand, he joins the general accounts section, he will have to check invoices and other documents; assist in preparing journal entries and recording transactions in personal or general ledgers; and generally make himself acquainted with the work of the section and the methods by which the transactions are entered in the books. As he progresses he may be put in charge of the personal ledgers, the general ledger or



Mr. Micawber's words of advice to David Copperfield are one of those classical sayings which every accountant learns, whether or not he is a reader of Dickens. "Annual income," said Mr. Micawber, "twenty pounds, annual expenditure nineteen, nineteen six, result happiness. Annual income twenty pounds, annual expenditure twenty pounds ought and six, result misery. The blossom is blighted, the leaf is withered, the God of day goes down upon the dreary scene, and —and in short you are for ever floored. As I am!"

investment ledger, and finally assist in the preparation of the Profit and Loss Account and Balance Sheet.

In the costing section he would be concerned with the collection of expenses, wages, materials, etc., under costing headings, and with the allocation over production of overheads, leading in due course to the final cost statements of each product which show the cost of each item per ton or unit, according to the business concerned. Costing in recent years has tended to become a specialised branch of accountancy, and his duties might comprise budgetary control of all expenditure, the

preparation of historical costs or the preparation of standard pre-costs, and all cost information required for the purpose of fixing the prices for products.

On entering a professional practising accountant's office for training, the articled clerk will in the first instance have to study fully the principles and practice of book-keeping, accounts, taxation, costing, law, and many other matters, in accordance with the syllabus for the examinations which he will have to take in the future.

In the early days of his apprenticeship his duties will normally take him out with qualified or semi-qualified accountants to do audits of firms and companies. In this way he will learn the rudiments of auditing, starting with humble tasks and gradually acquiring a knowledge of how the checking of a firm's books is carried out, both as regards accuracy and principles, up to and including the Profit and Loss Account and Balance Sheet. And, of course, he must expect to be transferred from one section of the office to another and so gain experience of taxation, liquidation, bankruptcy and investigations for prospectuses.

Although in this article it is quite impossible to give complete details of the duties an accounting clerk may be called upon to undertake, either in a commercial firm or with a professional practising accountant, I hope that the general outline which I have given above will enable an aspirant to an accountancy career to judge for himself whether or not he is likely to want to spend his future life in the profession of accountancy.

In conclusion there is one point which I think I should stress.

Accountants, particularly those with professional qualifications, are not by any manner of means restricted to their own sphere in commerce. Many of the leaders of industry today have either passed through the accounting departments of large firms or are members of one or other of the bodies which I have referred to earlier. In fact, one might say that a grounding in accounting knowledge acquired in an accounting department is today almost a prerequisite for any person who hopes to attain a directorship or a high executive financial or commercial position in a large company.

Information Notes



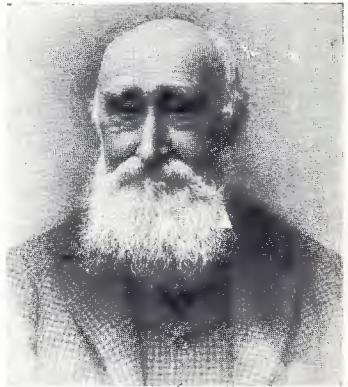
James Muspratt, 1793-1886



John Hutchinson, 1825-65



Henry Deacon, 1822-76



Holbrook Gaskell, 1813-1909

THE FOUNDERS OF THE WIDNES CHEMICAL INDUSTRY

By Sir Frederick Bain, M.C.

At the Widnes Centenary celebrations luncheon held at the Widnes Recreation Club on 9th June Sir Frederick Bain, M.C., Deputy Chairman of I.C.I., spoke as follows:

I have in the first place to bring to you the apologies of Lord McGowan, who is unable to be here today. He has just recently returned from a strenuous trip to East and South Africa and he has had to go for a short rest. He regrets that he cannot be with us. I give to all our guests a special message of greeting from him.

I appreciate to the full the honour of occupying this chair and of proposing the toast of Widnes. Today I wish to talk first of some of the early years of this wonderful century we are celebrating. It sometimes seems that this present time is one of the most disturbing and dangerous periods through which the world has passed. But I dare say that those who lived around the turn of 1850 and were alive to affairs thought pretty much in the same terms as we do today.

In 1847 Russia absorbed Poland; there was war in Switzerland. In 1848 there were revolutions in Paris, Berlin, Vienna, Sicily. Austria was at war with Sardinia. Prussia invaded Denmark—the Pope was forced to flee from Rome, and in this country the Habeas Corpus Act was suspended. We were fighting the Sikhs at Chillianwallah and Gugerat. In 1850 the British blockaded the Piraeus to avenge an assault on a British subject, whose name, strangely enough, was Don Pacifico. The writ of Britain ran far in those days. But let us remember that those same years saw the burgeoning of genius in Tennyson, the Brontës, Dickens and Thackeray.

I am indebted to my friend Mr. Leonard Brockington for an extract he made from an editorial of a Toronto paper called *The Examiner* and printed exactly a hundred years ago. It is an admirable illustration of the truth of the old French saying that "the more things change, the more they remain the same." Listen to these words:

"Russia, the empire which subsists on the most rude and naked basis of main force, is the great depository of warlike menaces; and the advance of her encroachment has now reached such a point that the next step seems certain to involve Europe in a war of resistance. The same unchecked progress which has brought Russia to that point must have taught her commanders a falsely delusive lesson of impunity. Every step has been successful. Province after province has had the Russian mark placed upon it and has been seized with an advance as steady and as undisputable as that of the backwoodsman with his axe in the forest."

There were indeed dark fears then also in the world.

When we look backward, as we are doing at this time of celebration, at nineteenth-century Widnes it is only by the exercise of imagination that we can picture the industrial and social life of the time, but in our backward survey we recognise familiar signals—*the personalities of men*, men who were at the same time victims and directors of the events which make the history of this town.

We live in an age when it is claimed that events have become so huge and complex that men no longer have the individual significance they had in former days. This is a view of our contemporary situation that I reject utterly. I cannot think of any notion more calculated to defeat human enterprise, originality and self-esteem and more likely to take away hope for our human future.

History has not become inhuman. Its course is, as it always has been, determined by fallible leaders and interpreted by even more fallible theorists. History is a human process, and it can in the ultimate be understood only in terms of human personalities, dealing in the light of their limited wisdom with circumscribing situations.

By no means let us forget that the early history of industrialism had its wrongs—its shocking wrongs of child labour,

filth and preventable disease. But let us not forget also that these wrongs were remedied, while the benefits of industrialisation remained, and are with us now.

It was glass that brought light into human homes; plumbing, soap and chlorine, health and length of days; the textile industries, and a host of others, that brought beauty and dignity.

The chemical factories may have appeared satanic enough—certainly they were no garden of roses—but the men who established and developed them bear no whit of resemblance to the grasping ogres of the conventional picture of industrialists in the past. They lived and toiled on the scene of their enterprises; the contributions they made in leadership and inventiveness were personal ones—they were the visible captains in the field of battle.

Practically without exception the Widnes chemical industrialists were men of culture with a high sense of their responsibility to the community—to this last, Mr. Mayor, your municipal records on every page bear witness. Not only we, who are more particularly connected with the chemical industry, may remember with honour today our forerunners in the field, but you and your fellow civic leaders can claim with pride these men as yours in the service of the municipality.

To John Hutchinson must go the credit of founding the alkali industry in Widnes—the industry which brought the modern industrial community into existence and gave it world renown as a chemical centre. There is some doubt as to whether in fact John McLellan was not making borax in the Lugsdale area before Hutchinson's arrival. However that may be, Hutchinson established his No. 1 Works at the mouth of what is still called the "New Cut" in the summer of 1847. In the course of a year or so he was employing more than a hundred men there in the manufacture of soda by the Leblanc process. The chemical industry history of Widnes had begun.

John Hutchinson was a remarkable personality. With no inherited wealth, with not more than a few months' experience in the manufacture of alkali, at the age of 25 he was owner and manager of his own factory. The early profits of his business, and presumably what he could borrow, went into the purchase of land near by, and he became the biggest landowner in the area. He had two objectives in mind. The first was to have somewhere to dump the rapidly accumulating factory waste. But the plan for which he deserves most credit for conceiving was that of cutting a dock and laying down a system of private railways to serve the future industries which he quite rightly expected would develop in the town.

More than ninety years ago John Hutchinson planned one of the first "industrial estates" in the country. After his death in 1865 at the early age of 40, it was round this dock and on his shrewdly acquired land that the second great development of Widnes chemical industry took place.

When William Gossage came to Widnes in 1850 he was already a seasoned man of affairs. He had been engaged in a series of more or less successful chemical ventures; he was 51 years of age and a tireless inventor. In 1859, when Gossage was working at the great problem of the nineteenth-century soda industry—the recovery of the sulphur from alkali waste—he wrote to James Hargreaves, another honoured name in the annals of Widnes:

I have been working at this subject (the recovery of the sulphur from alkali waste) at intervals for 25 years and have expended more than £10,000 in this pursuit . . . but unfortunately I cannot release myself from the fascination, and I still go on spending money.

He was essentially an inventor, and the fact that he established in Widnes a world-famous soap industry appears to be almost incidental to the serious business of his life.

Deacon is a name honoured in Widnes today and commemorated in association with the school here. Henry Deacon came to Widnes as Hutchinson's first works manager. He brought to his industrial career the benefits of early tuition by the great Michael Faraday and an apprenticeship in the shops of Nasmyth, the inventor of the steam-hammer. After about three years in the service of Hutchinson he crossed the Canal and there set about trying to realise a project which, unfortunately, was not technically matured for industrial development—the manufacture of soda by the ammonia process.

His first partner, William Pilkington, left him and his second one, Holbrook Gaskell, threatened to do so if he did not settle down to making soda by conventional and established methods. Deacon capitulated, but let us do him honour that he was not satisfied with things as they were.

The name Muspratt has a long and distinguished connection with the heavy chemical industry. It was James Muspratt who, in the words of his contemporaries, "made the manufacture of alkali a matter of national importance." That was in 1823, when he started his small factory at No. 289 Vauxhall Road in Liverpool.

Others had used the process in this country, but with no revolutionary results. James Muspratt's undefeatable optimism enabled him to fight the superstitions and conservatism of the soapmakers, to go on in the face of repeated prosecutions for alleged nuisance caused by his factory effluents, to keep calm when a falling chimney annihilated his factory at Newton, and when processes turned out not to hold the high potentialities prophesied by their inventors.

From 1847, for almost twenty years, McLellan, Hutchinson, Gossage, Muspratt, Gaskell and Deacon were the only names in the Widnes chemical industry. Their enterprise built up the tradition of this industry in the area, and during the great commercial spurt of the 70's other industrialists made Widnes the site of their undertakings.

Today Widnes is still proving a magnet for new chemical developments. Ludwig Mond, writing to his parents in 1872, said of Widnes, as he knew it, that "there is nowhere in the world where a factory could be set up with such ease and small capital, and where such working power can be found . . ."

Perhaps it is not generally realised that Ludwig Mond's sojourn in this town was as long and as important as it in fact was. When Mond came to England in 1862, as he himself put it, "to force his destiny," it was John Hutchinson who listened to his proposals in connection with the sulphur recovery problem and gave him facilities at No. 1 Works to try out his invention. Other industrialists had listened, but they had only been polite, and Mond had found himself outside their offices and no nearer gaining a footing in the alkali industry.

In these cautious days it seems almost absurd that a youngster with a few months' experience of industry and with a half-conceived process in his pocket—along with a handful of paternal florins—should seek to storm the gates of the British alkali industry, and—more amazing still that he should succeed. For ten years Mond made Widnes his headquarters; it was here that he established his home, and it was in Widnes that Alfred Mond, the first Lord Melchett, was born. It was here that Ludwig developed his sulphur recovery process—

the first solution of the problem that was finally to be solved by Chance of Oldbury.

But let us not forget that it was John Hutchinson who had the insight to realise that the enthusiastic young man from the Continent really had a worth-while idea and the ability to carry it to fruition.

It is not only in the field of chemical industrial production that Widnes can boast adventurous pioneers, but in that of chemical industrial organisation. When the old free trade world of the first half of the last century began to crumble, and the tariff walls rose in the long-established markets for our chemicals, it was here that chemical industrialists—Sir Edward Sullivan, John Brock and James Hawke Dennis, to mention three of them—conceived the reorganisation that enabled the alkali industry to survive into modern times.

But there have been giants nearer to our own time to whom credit must be given. Sir Max Muspratt, Sir Christopher Clayton, John A. E. Rayner and Sir Holbrook Gaskell are names honoured and respected in Widnes today, and I wish to pay tribute to those who still in active service have given, and are continuing to give, of their best on behalf of our industry in this town.

We salute the thousands of devoted people who have made the working population of Widnes. It is they who have given Widnes one of the greatest claims to distinction—the possession of the best, as they are the most self-respecting workers in our land.

In whatever degree, association with chemical manufacture provides an inexhaustibly interesting and exciting occupation.

In the chemical industry there is no resting on established process and routine, and the hereditary skill of the Widnes chemical worker will ensure the continuing development of the industry in this town.

There is another aspect of Widnes chemical enterprise which I must mention. In some ways it is the most important of all. It is the growing, living tip of the chemical industrial tree. I mean research.

From the days of Henry Deacon and William Gossage we have, in this home of the chemical industry, a continuous tradition of industrial research. In their wisdom the United Alkali Company consolidated and amplified that tradition by establishing here their Central Laboratory—the first important institution of its kind in Britain.

At first the research carried out was concerned with solving immediate difficulties associated with particular industrial processes. As a result of the United Alkali Company's policy the net of research was given a wider cast; aims which lay a long way over the horizon were pursued. It is such widely cast nets that are today bringing up strange and often valuable fish from the limitless deeps.

Whatever chemical discovery is made, it must ultimately become an industrial process if it is to have any effect on our human situation.

Such industrial processes, based on recent laboratory discoveries, have been developed in our own day in Widnes, and their effects have ranged thousands of miles from the factories that lie between the Canal and the Marsh. The all-devouring locust swarms have been torn from the skies—fields where Widnesians never trod have borne richer harvests—and some of the wards of the lock that imprisoned the energy of the atom have turned more quickly and easily.

Today we are, in the main, looking backward, but we do so, I hope, in order to look forward with confidence and resolution.

I have spoken of the adventurous men who in the face of great difficulties and disadvantages established the chemical industry in this town. They are the personalities who give history a familiar and human countenance, and who give the lie direct to the view that history is some mystical, superhuman process in which we participate only as victims.

Their stage, you may object, was small, but the human stage is, in the ultimate, always determined by the unities of time, place and personality.

Here today we are met on one of the classical sites of our great chemical industry. I do not think we could stand on more inspiring ground. After all, chemical industry is the most adventurous of all industries. We do not know what upheavals the very next discovery in our laboratories will call upon us to face, adapt ourselves to, and develop. If we seek courage and inspiration for our task, it is here in this century-old home of the chemical industry that we shall find it.

THE NEW 'ARDIL' FACTORY

By J. E. Braham (Engineering Controller)

Very satisfactory progress continues to be made with the erection of the buildings for the Nobel Division factory at Dumfries, where the new textile fibre 'Ardil,' a wool substitute made from groundnuts, will be produced. Work on site was begun in April 1949, and today, little more than a year later, all buildings, except that in which the actual spinning operations will be performed, are nearly finished. The steelwork for the spinning building, seen in the centre of the illustration, is up, and by the time this article appears sufficient of the roofing, wall brickwork, and the special acid-resisting floor will have been completed to permit the installation of the spinning machinery.

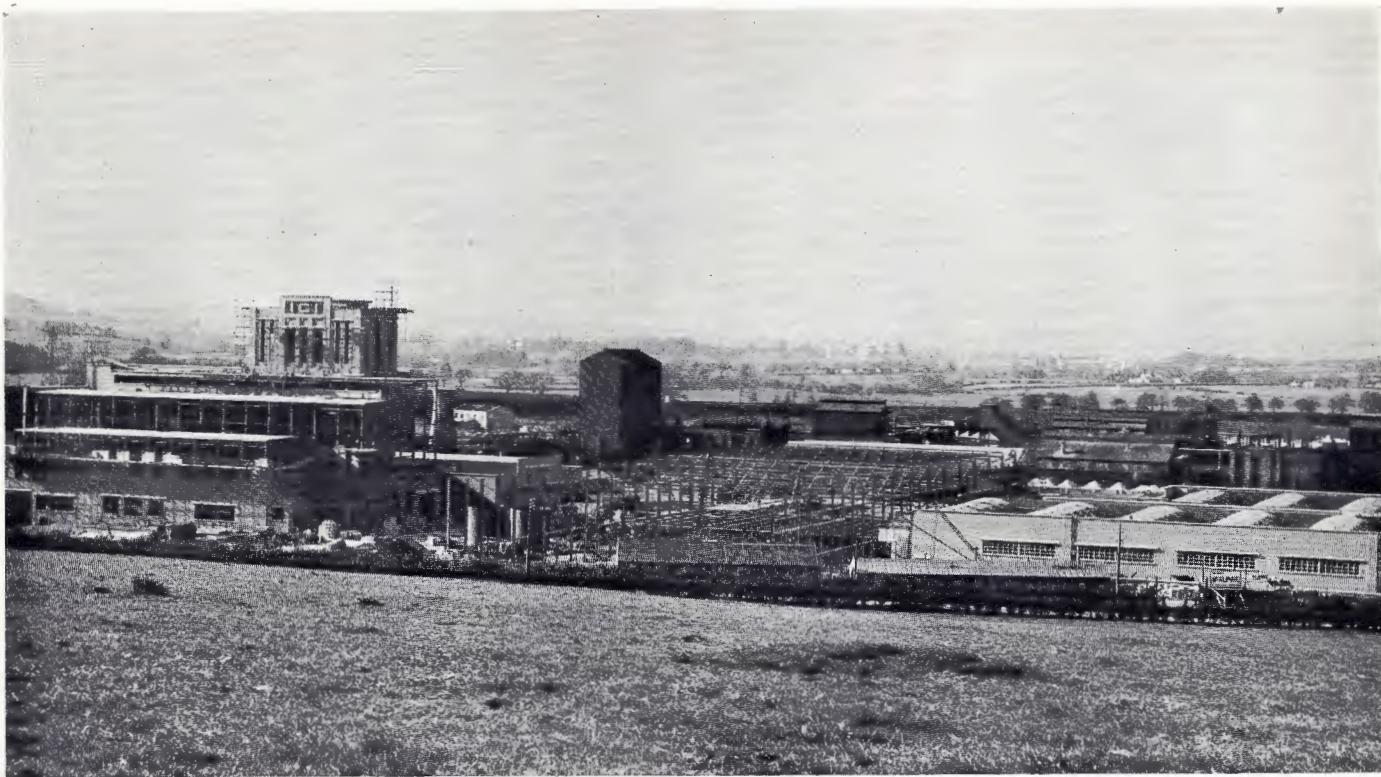
Much thought has been given to the design of all the buildings from the point of view of functional requirements, working conditions and external appearances. The finished factory should prove a striking example of how industrial buildings can be made attractive. The use of buff-coloured bricks for the outside walls gives a pleasing appearance, and the 110 ft. high tower will be a very impressive feature.

The buildings on the right of the illustration with their multiple vaulted roofs are, with the exception of the use of brick for facing purposes, constructed of reinforced concrete. They are the first of their kind to be built in Scotland. A changeover was made to concrete after work on site had actually started, as the steel-framed construction originally intended was being seriously delayed by late deliveries of fabricated steel. This change may have saved as much as six months.

Apart from delays in structural steelwork, there have naturally been other difficulties with which to contend, one of which may be of interest. During site-levelling operations a small area of ground with very poor load-bearing properties was detected, and as this area was the site of the heavy tower building it had to be made good by driving nearly three hundred 20 ft. long piles.

The stage has now been reached at which civil engineering and building work is giving place to the installation of plant. It is planned to have sufficient plant and equipment in position by February 1951 to start production with about one-quarter of factory capacity.

To achieve this will be no easy task; but as a result of early



A recent photograph showing the new 'Ardil' factory under construction

ordering of long-delivery items, their availability when required should be assured. In fact, very large quantities of electric motors, pumps, gearboxes, valves, and piping of various materials, including steel, copper, lead, polythene and many other items, are already at Dumfries housed temporarily in the large store building lying behind the tower building. This store has been constructed for the raw material derived from groundnuts from which the 'Ardil' fibre will be produced, as well as for the only by-product of the process, a meal which will be sold as an animal foodstuff.

THE RUSSIAN CHEMICAL INDUSTRY

Contributed by European Department

Someone once said, with a fair measure of truth, "There are no experts on Russia; there are simply varying degrees of ignorance." However, a careful examination of the evidence available does enable a more or less coherent picture of the chemical industry to be built up; and one knows, at least in rough outline, what the Soviet planning authorities are aiming at.

The point which must always be borne in mind is that Russian industry, in all its branches, has always lagged behind that of the highly developed countries of Western Europe; and the lag is as great in the chemical field as in any other. It is true that after the revolution great emphasis was placed upon the necessity of developing an adequate chemical industry, but the pace of development, in some branches at least, has been very slow.

The first of the post-war Five Year Plans is due to be completed this year, and in the case of the chemical industry it is

not merely a plan for development; it is a plan for radical reconstruction, with the aim of raising production greatly above the pre-war level. The plan devotes special attention to fertilizers, and it is said that half the total capital earmarked for the chemical industry has been allocated to the restoration and construction of fertilizer plants. The fertilizer question plays a prominent part in all discussions of planning, and Soviet publicists emphasise that an increased agricultural yield—a constant preoccupation of the Soviet government—is possible only on the basis of a greatly expanded fertilizer industry.

In general, the current plan says that there must be an intensification of work in the nitrogen, sulphuric acid, soda and aniline dye industries, and it stresses the importance of increasing the production of a vast range of semi-finished chemical products, connected especially with pharmaceuticals, lacquers and varnishes, plastic materials and dyestuffs.

Articles in the Soviet Press and the utterances of Soviet spokesmen two or three years ago envisaged the expansion of the industry so as to provide a considerable surplus for export in the comparatively near future; but to what extent the impressive aims proclaimed by the plan have been achieved is still a matter for conjecture.

The question whether the Soviet Union will eventually use its potentially great chemical resources for the purpose of participating in international trade on a large scale is one of great importance, but it can be considered adequately only in relation to the whole subject of Soviet foreign trade. It is noteworthy that Soviet spokesmen, in conversation with foreigners, often assert that the Soviet interest in foreign trade will wane in proportion as the country's internal economy develops; and past history does, to some extent, seem to show

that the political severance from Europe, which the bolshevik revolution brought with it, has, in general, been accompanied by an economic isolation, which has been modified from time to time but which tends to persist.

The great extension of Soviet influence which has taken place in recent years and has brought large areas (some of them in Europe, highly developed industrially) into the Soviet orbit has no doubt altered the nature of some of the problems confronting the Soviet Government; but the gearing of the satellites' industries to the Soviet system is presumably still far from complete, and it is too soon to speculate in detail upon the sort of economic relationship which will ultimately exist between the new bloc and the rest of the world. It is clear that the capacity of the Soviet Union to export is potentially very great; but it is equally clear that, for the time being, its power to do so is very severely limited.

KYNOCHE PRESS EXTENSIONS

By J. Kennedy, Manager of The Kynoch Press

The Kynoch Press has now extended its equipment to enable lithographic work to be undertaken. The first two Crabtree one-colour rotary offset machines have been installed and a further Crabtree rotary offset machine, which will print two colours at the same time, will be delivered very shortly.

The basic principles of the lithographic process can probably be best explained by going back to the original discovery, in the eighteenth century, that it was possible to print off a polished slab of absorbent stone by drawing on it with greasy chalk, damping it, rubbing ink over the surface, and applying paper. The greasy chalk is not wetted by the water, which is held in the pores of the stone; the roller leaves no ink on the wet parts of the stone but deposits a coating on top of the greasy chalk; the paper removes this ink when it is pressed on.

Today the slab of stone has been replaced by a thin, flexible plate of zinc or aluminium, the surface of which has been grained to enable it to retain enough water to meet the requirements of the process, and its preparation has been revolutionised by the introduction of photography. The grained plate is coated with sensitised albumen; line negatives are made of the type and any line drawings, and screen negatives are made of photographic or half-tone subjects. These negatives are stripped, each in exact position, to form a composite negative, and the sensitised plate is exposed to this in a printing-down frame faced by a battery of arc or mercury vapour lamps. The plate is then removed from the frame, rolled all over with greasy ink, and washed to remove the hardened parts of the albumen. With minor adjustments it is then ready for the machine.

The lithographic printing machine is now a complex mechanism, and incorporates the offset method of printing by which the image is first printed on to a rubber blanket and is then transferred to the paper. By this means fine detail can be printed on rough-surface paper without excessive printing pressure. Both the plate and the rubber blanket are stretched round cylinders, thus introducing the rotary principle and its great advantage in speed.

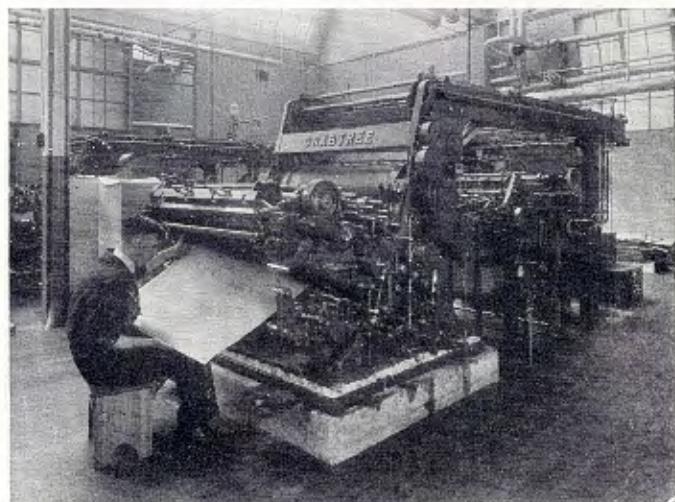
The plate is stretched round the printing cylinder, which is damped by a series of damping rollers as it rotates and is then inked by a pyramid of inking rollers. A second cylinder, the offset cylinder, carries the rubber blanket on to which the image is transferred off the litho plate; and a third, the impression cylinder, carries the sheet of paper round in contact with the blanket, thus completing the printing cycle.

After the plate has been prepared it is not usually necessary to spend nearly so much time preparing a job for printing on the machine as in the letterpress process, and the speed of printing is so much higher that, provided the quantity is sufficient, more economical production is obtained. Generally the clean, sharp results of printing half-tone illustrations on art paper by letterpress cannot be obtained by lithography, but on the other hand, fine detailed reproduction can be had on paper which can withstand handling well and which does not have the sometimes unpleasant high glossy finish necessary to get similar results by the relief letterpress process.

The work to be done on the new equipment will for the present fall into the following three main categories: (1) The printing of cartons in several colours; (2) Mass production of stationery forms, etc., for record and accountancy purposes (particularly where the lithographic process eliminates the additional operation of pen or disc ruling); (3) The printing of fine art work in the field of posters, booklets and brochures, especially where the character of these is such that advantage can be taken of the scope of the process to reproduce faithfully most forms of art and photographic work on a wide variety of paper surfaces.

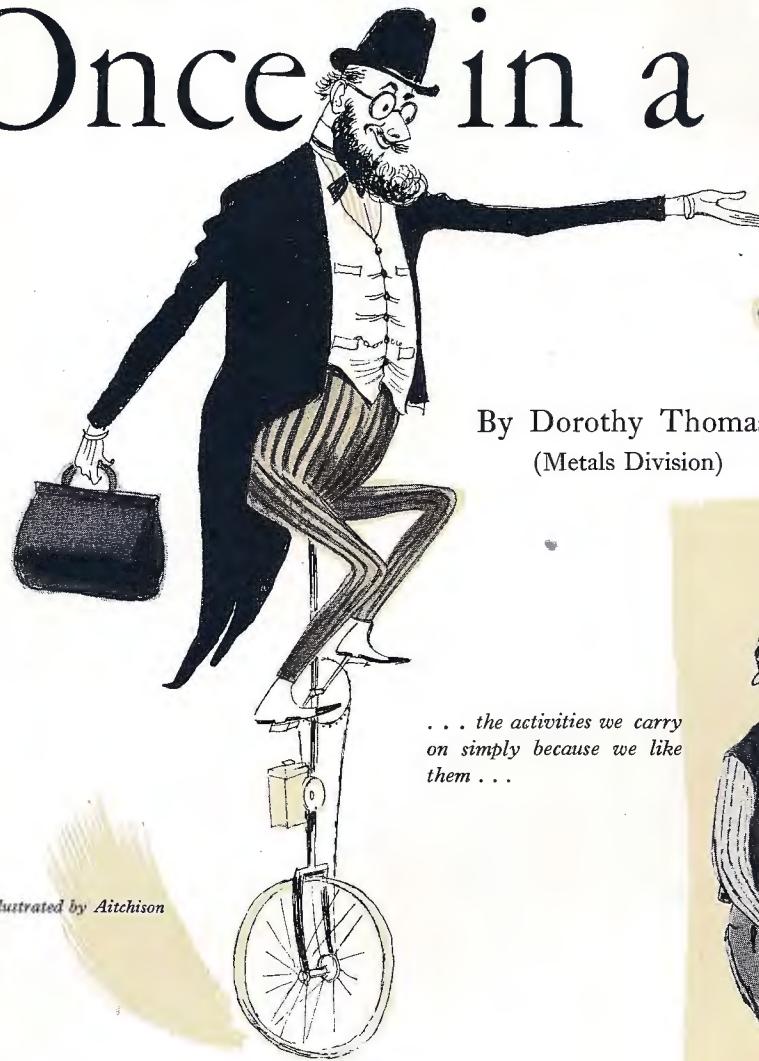
To take full advantage of this, and to make The Kynoch Press independent of outside resources, it may be necessary to create a complete photo-process department with camera equipment, process screens, and facilities for automatically printing down on plates in exact position. Developments in this field are at the moment fairly considerable, and it will be necessary to watch these closely to ensure that the best possible methods are available.

For some time past the demands made on The Kynoch Press have tended to exceed its capacity, and unfortunately many orders have had to be refused, selection being made of those which it seemed to be in the best interest of the Company to undertake. Considerable overtime working has been necessary, and deliveries have taken longer to effect than is desirable. The production from the Lithographic Department will alleviate this state and should enable better service to be given and should render The Kynoch Press capable of doing most types of work required throughout the Company except those for which very specialised plant is necessary.

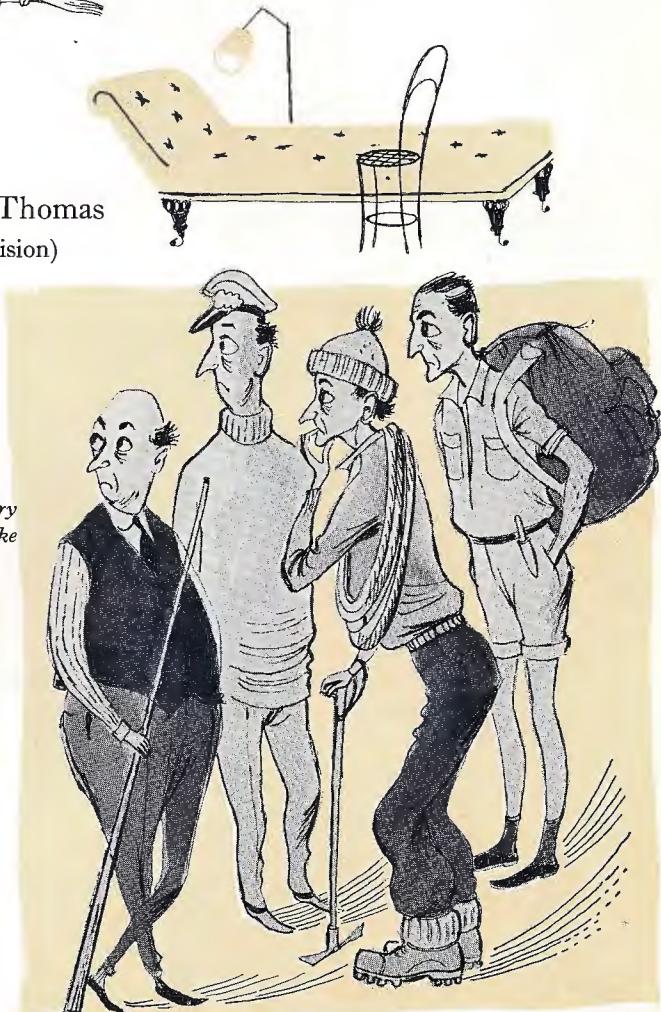


One of the new Crabtree presses at Witton

Once in a Lifetime



By Dorothy Thomas
(Metals Division)



A good deal has been said in the pages of this magazine about the hobbies, practical, cultural or merely enjoyable, in which I.C.I. people indulge. We've played billiards with Dr. Baldwin, sailed the Thames with Mr. Preston, fearlessly scaled mountains (sorry, rocks !) with Mr. Hilton-Jones, hitch-hiked with Mr. Begg. These hobbies—the activities we carry on simply because we like them—are perhaps material for analysis and interpretation in the hands of a psychologist. But to the ordinary person the things which happen just once in a lifetime and never again are perhaps a more fascinating study. For it is these which so often provide the highlights, the proudest boasts and the most bitter secrets.

Some of these happen by purest chance. Just once a thousand-to-one chance comes off, and we find ourselves, as pleased as Punch, reaping a reward we did nothing to earn. Maybe we drew the winning ticket in the office sweep; maybe our dog, or our cat, or our canary stole the local show; maybe the visiting V.I.P. chanced to notice our existence, ignoring our elders and betters. No credit to us—but how we cherish the event, polish it up and play with it !

My most astonishing fluke was to pass an examination in bookkeeping. Twelve years' education had failed abysmally to instil even the rudiments of mathematics; months of patient explanation and encouragement had left me quite unconvinced

of the merits of double entry. Yet, with neglected opportunity for study behind me and a compulsory examination before me, I rattled through the problems in a burst of inspired confidence, solved them accurately and—passed ! Fortunately I have not been called upon to repeat the experiment, and the examiners will never know that they issued a huge certificate to an entirely undeserving candidate.

Also devised by the gods or goddesses of chance are those odd accidents which, though they occur only once, have a surprisingly significant effect on us. That stray bit of information, gleaned incidentally and followed up by the slightest impulse of courtesy or curiosity; strange that the train of events set in motion as a result should, after all, be important enough to alter the course of a career. That chance encounter in extraordinary circumstances; incredible that so small a coincidence could knit two lives together, naturally and irrevocably. That childish discovery, adventure or misadventure; who can tell how profoundly it influenced the conduct of seventy or more years ?

These darts of destiny are beyond our control. But there are many others which we voluntarily try once and voluntarily or involuntarily give up with the maximum despatch. Into this class I would place my brief excursions into other people's pet pastimes—the odd occasions when I have allowed myself to be persuaded that perhaps after all I too would enjoy playing hockey, watching rugger, visiting ancient monuments, betting on dogs or horses. Of course, I didn't enjoy it. As either player or spectator, I hated the sweat and monotony of ball games; most of the historical houses left me with unenlightened mind and tired feet; the notorious beginners' luck of the race track ignored me altogether. It wasn't that I had made up my mind in advance not to enjoy myself. Oh, no! It was just that Fate had reserved a special contrariness to spite my hosts and make me more certain than ever of my own superior judgment.

Similar results have ensued, more often than not, from my periodic resolutions to be more imaginative in my diet. Sometimes the decision has been forced upon me—when, for example, politeness decreed that I should tackle a dish (I think, perhaps, cream cheese plentifully dredged with sugar was the prime example) which entirely revolted me. Sometimes, however, I had only myself to blame for the choice. Perhaps from a genuine desire to experiment, perhaps out of sheer bravado, I have shunned the familiar roast-and-two-veg. and plumped for an exotic foreign fancy. Whatever the reason, the result generally has been to add another item to my mental black list of food which, sampled once, is left alone for ever.

These gastronomic adventures are perhaps better for-

gotten. Not so the really exciting "once-only" experiences—the great efforts planned carefully, or undertaken in a moment of unthinking impulse, which add a piquant thrill to life's store of memories. Everyone has these moments. We all know someone who has thought it worth while to pinch and scrape for years so as to have one really glorious holiday. We have all met, and envied, a brave soul who has enjoyed the ultimate luxury, of saying, just for once, what he really wanted



We have all had our first pay-packet



to say, or bringing off, for the only time in his life, a timely and perfectly satisfactory retort. Once, perhaps, we ourselves have flashed out of our normal obscurity into pleasant prominence by accomplishing a twenty-mile walk, swimming a mile, or executing some remarkable or lovely piece of patient craftsmanship. The odds are long against our ever being able to repeat such a performance, even if we wanted to. But the fact that we did it once is unshakable, and the glory never quite departs.

No one will ever again be able to say of me, laziest of mortals in the matter of physical exercise, that I couldn't climb a mountain if I tried. For, carefully treasured, there is a photograph which displays me (albeit unrecognisable in improbable clothes and hideous boots) standing on a narrow and precipitous path well above cloud level. Of course I only did it out of sheer cussedness; of course I was scared stiff

practically all the time. We couldn't know, either, that when we reached the summit the heavens would open and I should have the added hazard of extremely slippery mud to negotiate on the way down. But at least my friends have my escort's word that, like B.E.A., he took me there and brought me back, and I'm sure I can trust him not to disclose the duration of our descent or the number of times he hauled me quivering to my feet.



More treasures are to be found in the thought of all the "first times" in our lives; for no matter how often certain experiences are repeated, the thrill of those initial steps into the unknown is never wholly recaptured. Here again examples are divided into the humdrum and the spectacular. We all have our first day at school, our first sight of snow or sea, our first recognised friend and confidante, our first wage packet, and the excitement with which we welcomed each new experience remains with us as long as we live (perhaps it even grows in sentimental retrospect!).

Then, still more carefully cherished, are the slightly more individual enterprises, ranging from world-shaking discoveries and breathless acts of bravery to the minor adventures which punctuate even our own unpicturesque lives. Even if I were to have the opportunity of travelling by air on all my future journeys, nothing could match the novel sensation, half

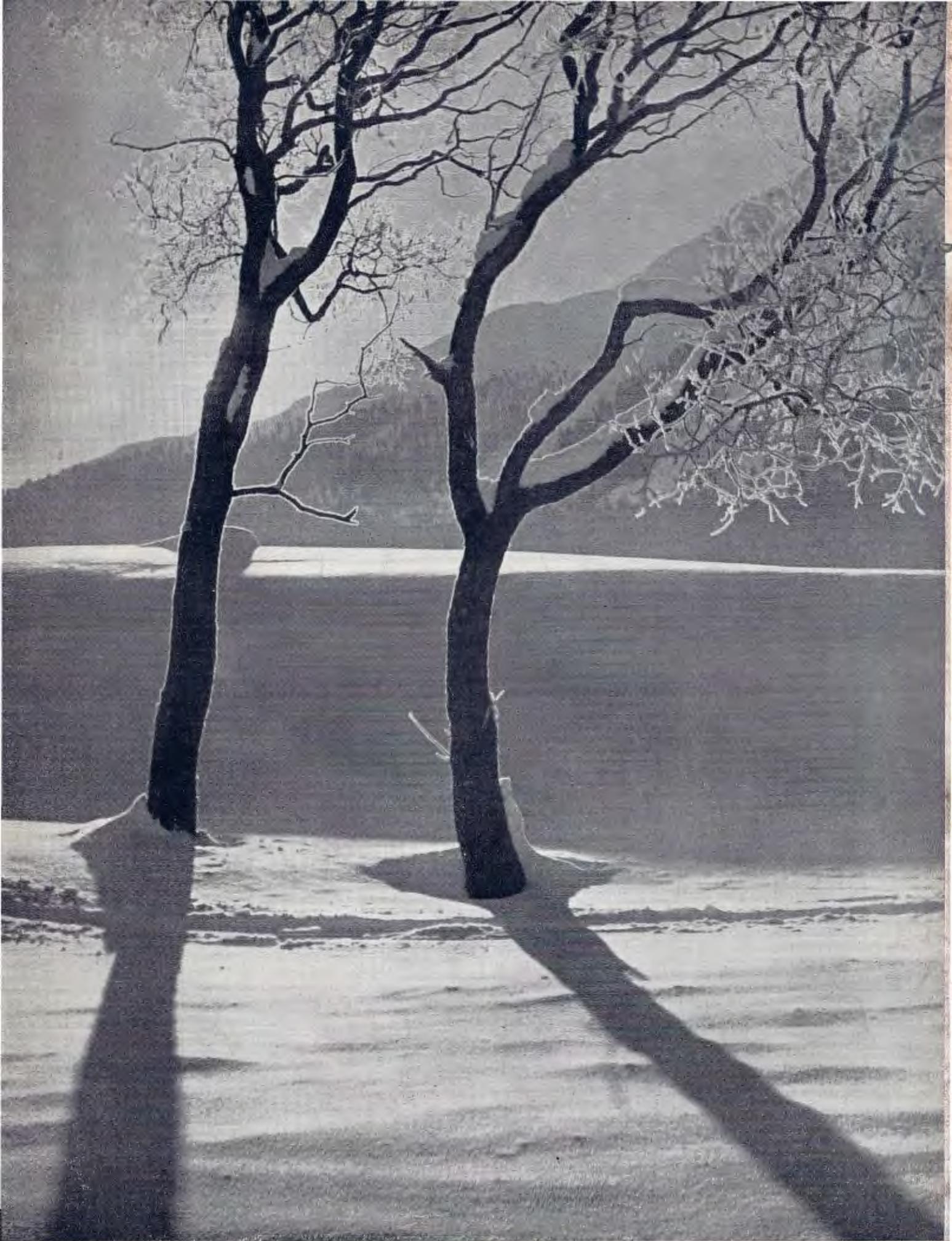


... saying, just for once, what he really wanted to say ...

excitement, half fright, which accompanied my first flight. I shall always remember the sight of the plane, silver in the sun and satisfactorily solid; the slightly sinking feeling with which I climbed the gangway and the curious resignation with which I watched preparations for the take-off; the incredible realisation that flying was, after all, quite an uneventful occupation; and the glow of pleasure with which I afterwards appreciated that for the first if not the only time in my life I had crossed the Channel without being seasick.

My hobbies, too, have given me my special memories—the glorious thrill (shared by all choristers) of contributing for the first time to a tremendously moving piece of music, the magnificent feeling of power (shared even by amateur actors) when I was first conscious of deliberately "controlling" a big audience. Unimportant as these trifling triumphs are, and irrespective of the number of times I may enjoy them again, they have given me some unique and magical moments.

These reminiscences should close, I feel, with an account of some more laudable once-in-a-lifetime activities—the bold, brave or selfless acts of courage or devotion which we like to believe we all accomplish at least once. The sad fact is, though, that the best of these are all too often associated with happenings which we like to forget and which we fervently hope not to experience more than once in our lives. So our flights into the realms of inspired generosity and courage generally go unrecorded. And perhaps that is just as well, for the knowledge that just once we reached the heights will generate its pleasant warmth longer if protected from the chilling winds of comparison.



A winter scene at St. Moritz, Switzerland (see page 231)